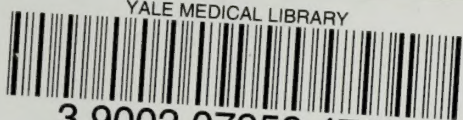


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THE
DENTAL COSMOS:
A
MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY
EDWARD C. KIRK, D.D.S., Sc.D.

Observe — Compare — Reflect — Record.

VOLUME XLV.

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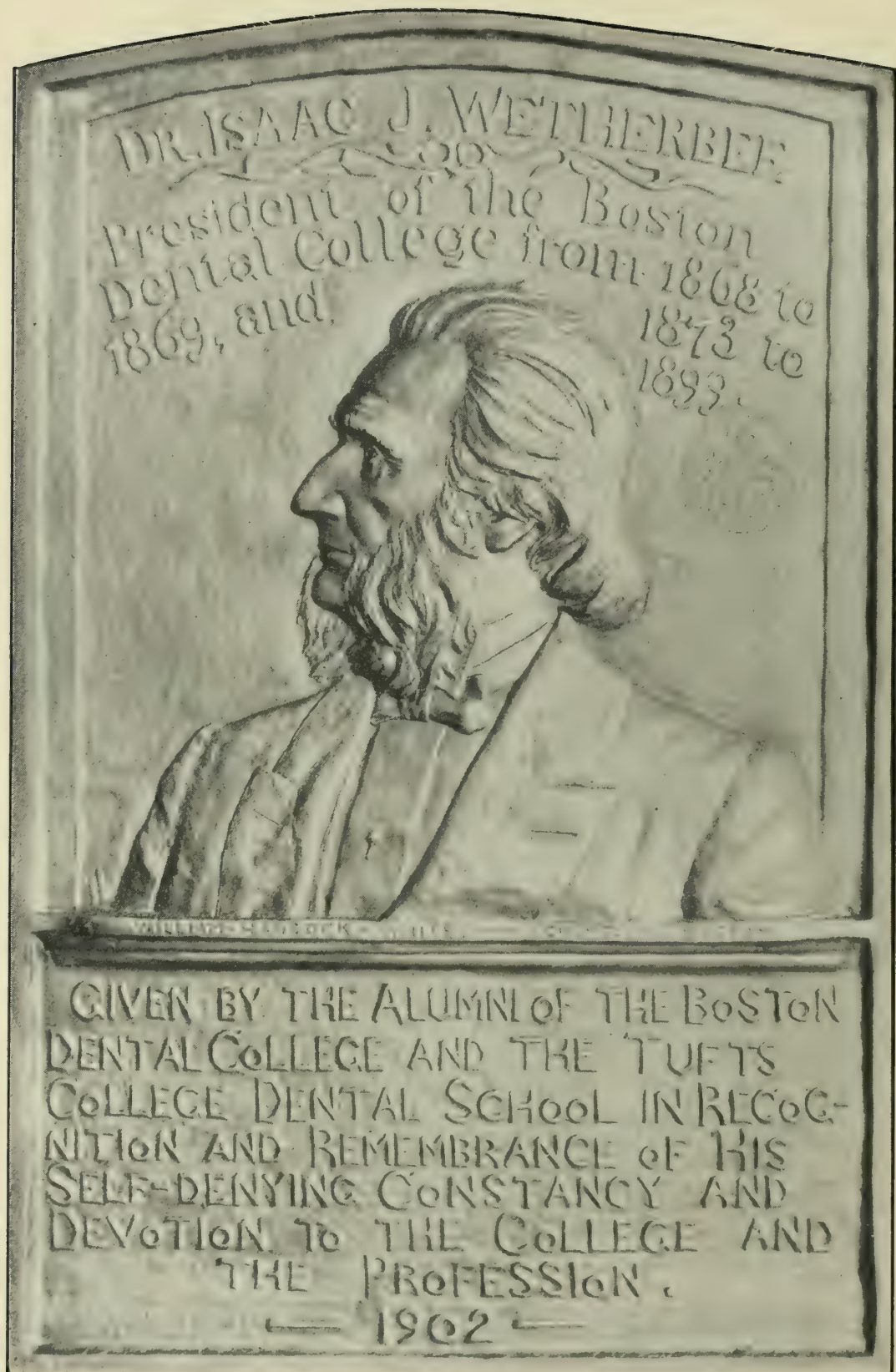
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ERECTED IN TUFTS COLLEGE DENTAL SCHOOL

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ORIGINAL COMMUNICATIONS.

INTRODUCTION TO THE STUDY OF IMMUNITY IN ITS RELATION TO THE DISEASES OF THE MOUTH AND TEETH.

By **W. D. MILLER, D.D.S., M.D., Ph.D., Sc.D., Berlin.**

THE methods of bacteriological investigation now in general use, which were introduced about the year 1870, made it possible, in a comparatively short time, to isolate a large number of different kinds of bacteria and to make a thorough study of them in regard to the conditions of development, physiology and pathology, not alone *in vitro*, but also in the animal body.

These studies soon definitely established the fact that different kinds of bacteria showed very marked differences with respect to their action on the animal body. The introduction of one kind into the animal system was seen to be followed by a more or less intense local or general reaction, while another kind, introduced in the same manner, created no inconvenience to the animal whatever. Bacteria of the first kind were called pathogenic; those of the second kind, non-pathogenic. It must be remembered, however, that no sharp line of demarkation can be drawn between these two groups, since in point of virulence we observe a gradual gradation from bacteria such as the anthrax and tubercle bacilli, which, introduced into the human or animal body in very small

numbers, or even singly, produce a fatal infection, to those which in enormous numbers do not bring about any disturbance whatever.

RELATIVE CHARACTER OF SUSCEPTIBILITY AND IMMUNITY.

It was, however, not only possible to ascertain that different kinds of bacteria manifested a totally different action upon one and the same animal, but that different species of animals were entirely differently affected by one and the same kind of bacterium. The cholera bacillus, for example, which is in a high degree pathogenic for the human body, does not, under ordinary conditions, have any effect at all upon the animal body. Guinea-pigs do not suffer from the attacks of the typhus bacillus, nor are chickens and doves in any way affected by the bacilli of tetanus and anthrax; and most animals used in our laboratories are not affected by influenza, leprosy, etc.

An animal in which a particular kind of bacterium produces symptoms of disease is designated as susceptible; one which being inoculated with large numbers of a particular bacterium shows no reaction is designated as insusceptible,

immune, or refractory. The conditions of immunity do not, however, represent a constant quantity. An animal which is normally immune toward a particular kind of bacterium may under certain conditions, such as protracted fasting, exposure to severe cold, bodily exhaustion, etc., become susceptible. For instance, the white rat, which is normally immune for the anthrax bacillus, becomes susceptible when made to run for hours on a treadmill until totally exhausted. Chickens which are immune to hog-cholera become susceptible if made to stand in cold water until the temperature of the body is perceptibly reduced, etc. From these facts we deduce the very important lesson that persons in a state of exhaustion should by all means avoid unnecessary exposure to infection.

ACQUIRED IMMUNITY.

It was not long before the far more important discovery was made that it is not only possible to induce an artificial susceptibility, but an artificial insusceptibility as well, whereby animals or human beings normally susceptible to a certain disease are, by a definite preliminary treatment, made immune to the same.

This discovery and the results which have already been worked out from it in the struggle against infectious diseases are to be numbered among the greatest victories which the human intellect has ever gained over inanimate forces.

Later on we will return to the question of immunity. At this point I wish only to emphasize one fundamental fact which forms the basis of our studies concerning immunity in its relation to diseases of the mouth and teeth. This fact may be expressed as follows: In the normal intravascular blood of every human being and animal there are substances (*alexins**) which to a certain degree afford protection against the invasion of pathogenic micro-organisms. This protection, which is of a general nature, appears in the one case exceedingly feeble and easily overcome, while in other cases, particularly against cer-

tain kinds of bacteria, it is sufficiently powerful to guarantee absolute immunity under normal conditions.

ORAL IMMUNITY.

Various well-known phenomena observed in the human mouth have led to the suggestion that here also protective substances similar to those found in the blood may be present. I call particular attention to the much-discussed fact that wounds in the mouth, as a rule, heal very readily and comparatively seldom give rise to severe infections; also to the equally suggestive fact that of two individuals living under exactly the same conditions, the one may be absolutely free from caries, while the other shows excessive ravages in nearly all his teeth. I have referred the first-mentioned fact to the high degree of resistance which the tissues of the human mouth in a normal condition present to the ingress of infectious agents. Others account for it by the assumption that saliva possesses an antiseptic action, in support of which they refer to the habit that dogs have of licking their wounds, which is supposed to be the cause of their rapid healing.

The views of different authors regarding the antiseptic action of saliva, as well as the results obtained from their experiments, have heretofore frequently been diametrically opposed to each other. Florian (*Gaz. méd. de Paris*, 1889, p. 317) attributes a direct though weak antiseptic power to saliva; likewise Sanarelli (*Centralbl. f. Bact. u. Parasitenkunde*, Bd. x, p. 818); whereas Triolo (*Riv. d' Igiene e di Med. Prat.*, an. 2, No. 12) found that filtered saliva, such as was used by Sanarelli possesses very slight antiseptic action. Also Hugenschmidt (*DENTAL COSMOS*, 1896, p. 797), whose investigations were most carefully carried out under Metchnikoff at Paris, came to the conclusion that the antiseptic action of saliva is most problematical, and that the immunity of the buccal tissues to infection cannot be attributed to such action. Poppert (*Med. Woch'ft*, 1893, p. 833) goes still farther in claiming that the high mortality re-

* 'Αλέξειν, to ward off.

sulting from the extirpation of the larynx is to be accounted for by the fact that saliva and mucus from the mouth coming in contact with the wound bring about a decomposition whereby the most favorable conditions for the causation of pneumonia are created.

INFLUENCE OF THE SALIVA.

On account of this diversity of opinion it seemed to me desirable that the question of the antiseptic action of saliva be again subjected to a thorough study, in order finally to bring about a definite solution. This question, besides being one of great general interest, demands especial attention in reference to the treatment of certain diseased conditions of the teeth. It is a well-known fact that, apart from the many local diseases of the mouth and teeth and their various sequences, the oral cavity serves as the port of entry for the bacteria of a long list of the most fatal diseases to which the body is subject. I need only refer to tuberculosis, pneumonia, cholera, typhus, etc. It consequently becomes a question of the greatest importance whether these infection-bearers are allowed to pass unchallenged through the mouth, or even make use of it as a point where they concentrate in sufficient numbers to carry out their attacks upon the body, or whether they come there to give battle to an equally subtle foe in which they may be totally destroyed or so far weakened that the danger for the time being is arrested.

Again, we have adopted the rule that in every attempt at the conservative treatment of an exposed pulp and in the treatment of root-canals it is absolutely necessary to exclude the saliva in order to prevent an infection or renewed infection of the tissues upon which we are operating. If, however, it should be proved that saliva possesses an antiseptic action, would it not be more rational to flood the pulp or root-canal with it in order to bring about the desired disinfection? We certainly have in the whole dental pharmacopeia no antiseptic more devoid of irritating properties.

FACTORS OF THE PROBLEM.

The solution of the question of the antiseptic action of saliva forms the first step, but only the first step, of the ladder which leads to a complete understanding of the subject of immunity in its relation to the tissues of the mouth and teeth. A large number of questions come up one after another for solution, —some of which I have in the present communication attempted to treat more fully, others only to touch upon. These questions are—

(I) Does the human saliva possess properties which are capable of preventing or retarding the development of bacteria or processes of fermentation in the human mouth?

(II) Does the presence of potassium sulfocyanid in the saliva contribute to its supposed antiseptic action?

(III) Is any protective action to be attributed to the oral mucus?

(IV) Do the bactericidal properties of saliva exist in a more marked degree in persons immune to caries than in those highly susceptible?

(V) Does fresh saliva contain bactericidal substances analogous to the alexins of the blood, which become inert on standing?

(VI) Does saliva possess globulicidal or hemolytic properties?

(VII) What part do auto-purification and the struggle for existence play in the human mouth?

(VIII) Do the mixed oral secretions have a bactericidal action upon pathogenic bacteria?

(IX) What part does phagocytosis play in the mouth?

(X) Do the bacteritic membranes on the teeth afford a protection against, or do they facilitate, the process of caries, or are they indifferent to it?

(XI) How is the frequency of caries influenced by the reaction of the saliva?

(XII) Do the teeth themselves show differences in structure or composition which afford an explanation of the marked difference in their susceptibility to caries in different mouths?

(XIII) Are there conditions of immunity present in the tissues of the

human mouth which bring about a state of local immunity varying in degree in different persons and under different circumstances?

(XIV) Does the saliva possess anti-toxic properties?

BACTERICIDAL PROPERTY OF THE SALIVA.

My experiments were accordingly directed in the first instance toward the solution of—

QUESTION I—*To what extent does saliva, by means of its bactericidal properties, put a check upon the development of bacteria and upon processes of fermentation in the human mouth?*

No reference is had here to the action of saliva upon pathogenic bacteria, this point being dealt with separately under Question VIII.

When we wish to determine the possible antiseptic action of any substance in solution we must first make sure that the solution does not contain, besides the one to be tested, any other substance which might in any way exert a retarding influence upon the development of bacteria. Furthermore, the solution must contain a sufficient amount of nutriment, and must be kept under such conditions of temperature as are most favorable to the development of the bacterium used in the test.

Sufficient attention has not been paid to these demands in the experiments relating to the antiseptic action of saliva. In particular, solutions have been used containing so very little organic substance that from this reason alone the development of many bacteria might be seriously interfered with. Sanarelli, whose experiments were for many years considered conclusive, filtered the saliva through a Chamberland filter, by which it was deprived of by far the greater part of nutrient matter, it containing, after filtering, but a small fraction of the amount of organic matter we are accustomed to add to our culture media; and when consequently particularly sensitive bacteria refused to grow in this solution, that fact cannot be regarded as a proof of its antiseptic action.

It is furthermore well known that bacteria as a rule require some time to accustom themselves to new surroundings, and when we transfer them, for example, from bouillon to a medium of such different osmotic properties as filtered saliva, many of them die simply as a result of the change, irrespective of any antiseptic property of the solution. If we were to test the antiseptic action of filtered water we would arrive at results quite as unfavorable as those which Sanarelli obtained for filtered saliva. We are consequently not entitled to draw any conclusion whatever from his experiments until we have excluded the sources of error above mentioned.

We may put it down as a rule that our experiments must be carried out with such media and under such conditions as admit of a rapid growth of the bacterium used in the test. We have, then, to determine whether the addition of saliva to our medium prevents or retards the development of the bacterium.

ANTISEPTIC VALUE OF GERM-FREE SALIVA.

Experiments: First series—the saliva being passed through a Chamberland filter. My first experiments were designed to test the accuracy of the results obtained particularly by Sanarelli with saliva filtered through porcelain. In accordance with the principles stated I prepared a solution of bouillon from beef-extract, peptone, and sugar, of double the customary strength, and filled a number of test tubes each with 5 c.cm. To three of these test tubes I added an equal amount of filtered saliva of A, who is immune to caries. To the same number I added saliva of B, and finally, as controls, to an equal number I added sterile water. The saliva having been passed through a Chamberland filter was consequently free from bacteria and exceedingly poor in organic substances, so that by its addition, as well as by that of the water, the bouillon was reduced to the concentration ordinarily used in culture media. Finally the tubes were inoculated with a bacterium obtained from decaying dentin. If now the saliva

contained any bactericidal properties, we must expect the development of the bacteria in the tubes to which it had been added to be retarded, compared to that in the solutions which were diluted with water, and especially we should expect to find a marked retarding influence on the part of the saliva of A.

These expectations were, however, not fulfilled, the cloudiness appearing in the tubes containing saliva quite as soon as in the others. This experiment was repeated a number of times and invariably with the same result; I was not able to determine any retarding influence whatever on the part of the saliva.

Three different methods were made use of for determining whether the number of bacteria in any solution was on the increase or decrease, and also for comparing the rapidity of growth of bacteria in the different media. In cultures made in perfectly transparent media, their subsequent clouding served as an index as to the rapidity of development of bacteria. If, for example, we inoculate a solution of bouillon, and after thoroughly shaking divide it into two equal parts, and add to the one a given antiseptic, we will find that this becomes cloudy later than the others; the time which elapses between the appearance of the cloudiness in the two solutions may at once furnish a certain index as to the strength of the antiseptic added,—and of course if the antiseptic is sufficiently strong the solution will remain clear indefinitely. Only a limited use was made of this method.

RATE OF ACID PRODUCTION.

A second method consisted in determining the quantity of acid produced in the culture in a given time. In questions relating to the origin and course of dental caries we have to deal not so much with the numbers of the bacteria as with their potency or capacity for bringing about processes of fermentation. For this we have a measure in the quantity which they form in a given time. This determination may be very easily made by counting the number of drops of a 5 per cent. solution of bicarbonate of soda necessary to neutralize

the contents of the separate culture tubes. The drops from a pipette, regulated by a stopcock, were absolutely equal in size and counted 49 to 3 c.cm.

The third method which I employed is the one most commonly used, and consists in determining from time to time the number or comparative number of bacteria actually present in the cultures. For example: if we inoculate a given solution with a certain bacterium and wish to determine its rate of increase or decrease, we transfer at once a minute drop of the solution (on a loop of platinum wire) to a tube of nutrient agar, which has been melted and cooled down to about 50° C., and then pour the agar into the culture dish in the usual manner. We repeat this procedure at certain intervals, say after one, two, four, ten, twenty-four hours, etc. The number of colonies which subsequently appear in the agar cultures will tell how many bacteria there were in the corresponding loop of the solution.

ACID PRODUCTION IN CONCENTRATED SOLUTIONS.

In the experiments reported above, the saliva was diluted with equal parts of bouillon, and presented a 50 per cent. solution only. In order to test the action of more concentrated solutions, I prepared a bouillon of fivefold strength, and added to one part of this four parts of saliva. By this means I obtained an 80 per cent. solution of saliva in culture bouillon. In the control tubes one part of the bouillon was diluted with four parts of water.

The first experiment with 80 per cent. solutions of the saliva of C, E, and F, gave the following results. The numbers denote the number of drops of the alkaline solution required to neutralize the contents of the tubes, and correspond therefore to the relative amount of acid formed in the time specified:

	In 42 hours.	In 20 hours more.	Total.
C	9½	5½	15
E	9	7	16
F	10	7½	17½
Control	9	7	16

From these results we see that quite

as much acid was formed in the tubes in which the bouillon was diluted with saliva as in those in which it was diluted with water; in other words, even 80 per cent. solutions of saliva were powerless to exert a retarding influence on the process of fermentation.

Finally, by mixing 4.5 c.cm. of saliva with 0.5 c.cm. of a tenfold solution of culture bouillon, I obtained 90 per cent. solutions of saliva in bouillon which were compared with solutions similarly diluted with water. On mixing filtered saliva with these tenfold solutions of bouillon a cloudiness sometimes appears, either immediately or soon after, which of course must not be confounded with the cloudiness produced by a growth of bacteria. I have frequently observed that saliva from one person causes the bouillon to become cloudy, while that of another leaves it perfectly clear, there being evidently some substance in the saliva of the one which was absent in that of the other; I did not, however, make any attempt to determine its nature. Where a cloudiness of this kind appears in the bouillon we must determine the rapidity of development of bacteria or their ferment activity either by making plate cultures from time to time or by measuring the amount of acid formed at certain intervals. In many of the subsequent experiments these intervals have been placed at twenty-four, forty-eight, seventy-two, etc., hours, and designated by I, II, and III.

In the first experiments with the 90 per cent. solutions of saliva, five tubes were prepared from the saliva of M, two from that of A, two from that of H, and four control tubes. The following average result was obtained:

	I.	II.	Total.
A	7½	14	21½
H	8	14	22
M	9	13½	22½
Control	8½	14½	22½

From these results we see that there is but a slight difference in the amount of acid produced in the bouillon diluted with saliva from that diluted with water. The saliva of M, who is almost free from caries, showed even a somewhat

stronger fermentation than that of H, who is highly susceptible. The saliva of the immune A shows in this, as in many other experiments, a somewhat slighter ferment activity than that of the others. In some experiments the difference is still more pronounced, whereas in others, as we shall see farther on, there is no difference whatever. On the whole, this difference is far too insignificant to be looked upon as an explanation of the cause of A's immunity.

ACTIVITY OF UNDILUTED SALIVA.

In order to test the activity of undiluted saliva I found it necessary to adopt another method, which at the same time simplifies the operation considerably. Instead of filtering and then adding the necessary nutrient substances, these were added in dry form before filtering. For example, to 30 c.cm. of saliva I added 0.67 gm. of grape sugar and 0.67 gm. of peptone; this gives a 2 per cent. sugar-peptone solution in saliva, which may then be filtered through the Chamberland filter and freed from bacteria; 30 c.cm. of water, with the above-mentioned quantity of peptone and sugar, were also filtered in the same way and gave the same solutions without saliva for the control experiments. A solution prepared in this way from the saliva of A, and infected with *Bac. prodigiosus* showed a more active fermentation than the control solution, just double the amount of acid being produced.

In order to put the bactericidal properties of the saliva to a further test, I filtered a quantity of the saliva of B and C, and infected 5 c.cm. of it with *Bac. prodigiosus*. As control I infected 5 c.cm. of hydrant water which had been passed through the same filter. In twenty-four hours the saliva was much more cloudy than the water, and plate cultures showed that it contained three times as many bacteria. At the end of a week the number of bacteria in the saliva was four and two-thirds times as great as that in the water. Accordingly *Bac. prodigiosus* finds more favorable conditions for development in a nutrient bouillon

made from saliva than in one similarly made with water, and also a more favorable medium in saliva alone than in water alone. This experiment was repeated three times, and always with a similar result.

An experiment with my own saliva gave the following results: Number of germs in one loop of saliva at the beginning of the experiment, 52; after $\frac{1}{2}$ hr., 63; 2 hrs., 74; 24 hrs., 12,500. The same experiment made with sterilized water gave, as corresponding results, 64, 75, 46, 42. We see therefore that while the number of bacteria in the saliva rapidly increased, it diminished in the water. This certainly does not say very much for the antiseptic action of saliva. The decrease in the number of bacteria in the water is of course not due to its antiseptic action, but simply to the fact that water does not contain sufficient nourishment.

In order to emphasize the action of any antiseptic which may possibly be in saliva in a very diluted form, I filtered the saliva, after adding 1 per cent. of peptone and sugar, through a Chamberland filter, and reduced it over the water-bath to half its volume. I then inoculated this condensed saliva with a caries bacterium, inoculating at the same time a 2 per cent. aqueous solution of peptone and sugar in the same way as control. In each case there were three tubes. The average amount of acid produced during the first, second, and third days was as follows:

	I.	II.	III.	Total.
Bouillon of condensed saliva...	5 $\frac{1}{2}$	8	2 $\frac{3}{4}$	16 $\frac{1}{4}$
Water bouillon	5 $\frac{1}{2}$	8	1	14 $\frac{1}{2}$

From this experiment we see that even condensed filtered saliva does not exert any retarding influence upon the process of fermentation in comparison with water.

NON-FILTERED SALIVA AND SALIVA FILTERED THROUGH PAPER.

There is a possibility, and in fact a probability, that in passing saliva through a porcelain filter, certain sensitive bactericidal substances which it might be supposed to contain would partly or totally lose their power. We

therefore recognize the necessity of making control experiments with non-filtered saliva. Here, however, the great difficulty arises of obtaining saliva free from bacteria, since it may be considered absolutely impossible to completely sterilize the human mouth, though an approximate sterilization might possibly be accomplished in edentulous mouths. The task of obtaining a sufficient quantity of saliva for purposes of experimentation direct from the glands and free from bacteria also meets with great difficulty. We are able, however, to overcome these difficulties by experimenting with bacteria which develop rapidly at room temperature. We know that if we make a plate culture from human saliva and keep it at ordinary room temperature, we will find, as a rule, after two or three days that nothing whatever has developed. It is consequently only necessary to filter the saliva through ordinary filter paper, which does not change its constitution while it frees it from by far the greater majority of bacteria which it normally contains, and then to infect it with some bacterium which grows well at room temperature, *e. g.* with *Bac. prodigiosus*. If we keep the saliva thus infected at room temperature and make plate cultures of it from time to time which are likewise so kept, and in which consequently only the bacterium which we have inoculated develop, we are enabled to carry on the experiment without disturbance on the part of the bacteria normally present in saliva. From the number of colonies which appear in the different cultures after two days we can readily see whether the bacilli introduced into the saliva are on the increase or decrease.

EXPERIMENT I. Number of bacteria: At first, 2100; after $\frac{1}{2}$ hr., 2640; 1 hr., 3600; 2 hrs., 1956; 3 hrs., 2820; 4 hrs., 1920; 26 hrs., innumerable.

The second experiment, in which a small quantity of peptone and sugar was added to the saliva before filtering, gave the following results:

II. Number of bacteria: At first, 2040; after $\frac{1}{2}$ hr., 2400; 1 hr., 1956; 2 hrs., 2280; 3 hrs., 2040; 4 hrs., 2340; 26 hrs., innumerable.

III. Saliva of an edentulous woman: At first, 28; after $\frac{1}{2}$ hr., 80; 24 hrs., 156; 48 hrs., 14,600.

IV. Saliva of one immune to caries: At first, 357; after $1\frac{1}{4}$ hrs., 580; 4 hrs., 678; 24 hrs., 72,000.

V. At first, 110; after $\frac{1}{2}$ hr., 148; 1 hr., 165; 2 hrs., 123; $2\frac{1}{2}$ hrs., 162; 24 hrs., 5400.

VI. At first, 118; after $\frac{1}{2}$ hr., 121; 1 hr., 215; 2 hrs., 123; $2\frac{1}{2}$ hrs., 121; 24 hrs., 5200.

VII. At first, 5; after $\frac{1}{2}$ hr., 8; $5\frac{1}{2}$ hrs., 13; 24 hrs., 146.

VIII. Saliva of an immune: At first, 59; after $\frac{1}{2}$ hr., 76; $1\frac{1}{2}$ hrs., 76; 24 hrs., 3600.

IX. At first, 45; after $1\frac{1}{4}$ hrs., 72; $2\frac{1}{2}$ hrs., 21; 24 hrs., 32,000.

X. At first, 107; after $1\frac{1}{4}$ hrs., 105; $2\frac{1}{2}$ hrs., 16; 24 hrs., 12,000.

SALIVA NOT GERMICIDAL FOR EXTRA-ORAL BACTERIA.

From these results it appears very plain that saliva has not the power to prevent the development of a micro-organism which does not normally inhabit the mouth. The oscillations which appear in some of the experiments may be accounted for by the fact that the bacteria are not always distributed equally in the saliva, and that especially the quantity of liquid which is carried by a platinum loop, even when taking the greatest precaution, is subject to considerable variations. The falling off in the numbers in *some* of the experiments (especially IX and X) about the second hour might be used as an argument for the supposition that the saliva contains some antiseptic principle which it loses on standing. For reasons given below, and especially under Question V, I doubt this, but shall not pronounce finally upon it till after further experiments.

The idea that human saliva may have an antiseptic action in respect to the bacteria habitually found in the mouth itself seems to me utterly untenable. It is about as reasonable as it would be to constantly reiterate the assertion that grass is a poison for cattle, knowing at the same time that cattle flourish exceedingly well in a good meadow. We know that a considerable number of bacteria which we may designate as the oral flora are constantly found in the human mouth. As often as they are removed mechanically, by brushing or in the process of mastication, they rapidly form

again, and there is no doubt that they find a very favorable culture medium in the fluids of the mouth. Notwithstanding the knowledge of these facts there are many who still maintain that those fluids are poison for such bacteria.

EXPERIMENTAL PROOF.

It seems almost superfluous to approach this question experimentally, since we can *a priori* with the greatest certainty exclude any possible antiseptic action of saliva in respect to the normal oral flora. I have nevertheless made a few experiments in which the saliva with or without addition of sugar and peptone was passed through a paper filter and then put in the incubator. From the results here appended it may be seen that the bacteria increased in number from hour to hour.

EXPERIMENT I. On addition of peptone and sugar. Number of bacteria: At beginning, 2640; after $\frac{1}{2}$ hr., 2520; 1 hr., 4800; 2 hrs., 3000; 3 hrs., 10,800.

II. Without such addition: At beginning, 2400; after $\frac{1}{2}$ hr., 2520; 1 hr., 2000; 2 hrs., 2196; 3 hrs., 4080; 20 hrs., 10,600.

III. At beginning, 48; after $1\frac{1}{4}$ hrs., 29; $2\frac{1}{4}$ hrs., 28; 18 hrs., 36,000; 24 hrs., 67,000.

IV. At beginning, 510; after $1\frac{1}{4}$ hrs., 1050; 23 hrs., 5300.

In these as in all other experiments in which mouth bacteria are transferred to new media or are brought under changed conditions, we often find a diminution in the number of germs in the first hour or two. This diminution (aside from the oscillations caused by irregularities in the size of the drops conveyed by a platinum loop) may be accounted for by the fact that the bacteria require a certain amount of time to accustom themselves to the changed conditions. For this reason a decrease in numbers may take place when bacteria are transferred from saliva to bouillon prepared from beef extract, peptone, and sugar, as is evidenced by the following experimental results. The decrease in this instance is not due to any antiseptic action:

Number of bacteria: At beginning, 2100; after $\frac{1}{2}$ hr., 2200; $1\frac{1}{2}$ hrs., 1800; 5 hrs., 20,800.

It is not to be wondered at that the bacteria of the mouth require a certain

time to accustom themselves to changed conditions, since many of them do not bear transplantation under any circumstances, or at least all attempts to secure growths on artificial media have failed up to the present.

Here again, as in the experiments recorded above with filtered saliva, I tested the effect of its condensation upon the supposed antiseptic properties of non-filtered saliva. I reduced the saliva of the relatively immune E and the highly susceptible C, H, and K to half their volumes over the water-bath, but restored that of C, H, and K to its original volume by the addition of sterilized water. I was then able, after adding peptone and sugar, to compare the condensed saliva of the immune E with the similarly treated but not condensed saliva of the extremely susceptible persons C, H, and K. I obtained the following average results:

	I	II.	Total.
E (condensed).....	10	8 $\frac{3}{4}$	18 $\frac{3}{4}$
C	7 $\frac{1}{2}$	8 $\frac{3}{4}$	16 $\frac{1}{4}$
H	9	9	18
K	10	5	15

Accordingly, the saliva of E, from which we might have expected an antiseptic action, showed even in concentrated form a somewhat greater ferment activity than that of C, H, and K.

ELIMINATION OF HEAT FACTOR.

The objection may be made to this experiment that certain sensitive antiseptic substances in the saliva may have been destroyed by the heat to which it is subjected over the water-bath. In order to free the experiment from this perfectly just objection, I brought the saliva into a shallow glass vessel and allowed it to concentrate by evaporation in the incubator at the temperature of the human body; 30 c.cm. of the saliva of H and K together were in this way reduced to 5 c.cm. The fermentation of this sixfold saliva on addition of peptone and bread produced at intervals of twenty-four hours 10 and 8 $\frac{3}{4}$ units of acid; that is, the antiseptic substances contained in the saliva, even in six times their normal strength, permitted fermentation to go on in the ordinary manner.

Again, the saliva of C was reduced in the incubator to one-third its volume and was compared with the saliva of the same person which was kept in the incubator for the same time in a stoppered bottle, *i.e.* subjected to the same conditions without evaporation or condensation. The condensed saliva produced 16 and 20 units of acid, against 12 and 16 for the non-condensed. Accordingly, instead of the antiseptic action of saliva being increased by the condensation, we see quite the contrary result in this experiment. No objection can be offered to this experiment as far as it relates to the less sensitive antiseptic substances which may possibly be in saliva. Should it, however, contain very sensitive bodies, such as alexins, then it is quite possible that the process of condensation, even at the temperature of the human body, might exert a deleterious influence upon them. We will return to this point under the fifth heading.

COMPARATIVE STUDY OF EQUINE SALIVA.

The saliva of a horse compared with that of C gave the following results:

<i>Horse's saliva with starch.</i>						
	I.	II.	III.	IV.	9 days.	Total.
(1) 0	0	8	5	9	1	23
(2) 0	0	7	3	8	6	24
<i>C's saliva.</i>						
	11	12	11	16	4	54
<i>Horse's saliva with sugar.</i>						
(1) 0	0	5	2	12	0	19
(2) 0	0	6	2	9	0	17
<i>C's saliva.</i>						
	11	12	11	14	0	48

The formation of acid is seen to be throughout much less in the case of equine than in that of human saliva. It is particularly to be noted that in the first twenty-four hours no acid at all was produced, which is, however, to be accounted for by the fact that the saliva of the horse showed a strong alkaline reaction at the beginning of the experiment. In the present case I found that twelve drops of my 5 per cent. solution of bicarbonate of soda were necessary to produce an equally strong alkalinity in 5 c.cm. of water. In reality, therefore,

the total amount of acid produced, for instance, in the first experiment was not $0 + 8 + 5 + 9 + 1 = 23$, but $12 + 8 + 5 + 9 + 1 = 35$, only the 12 units of acid produced in the first twenty-four hours were neutralized by the alkalies normally present in the saliva of the horse. The above results indicate one of the reasons why caries appears so rarely in the teeth of horses compared with its occurrence in human teeth.

INFLUENCE OF POTASSIUM SULFOCYANID.

QUESTION II—*Does the presence of potassium sulfocyanid in the saliva contribute to its supposed antiseptic action?*

Having sought in vain for antiseptic properties in the saliva as a whole, it seems scarcely probable that we should be able to find them in any of its constituents. Nevertheless it seemed desirable that the tests should be made. Most of the inorganic constituents of the saliva, such as carbonate of potassium and sodium, the chlorids and phosphates of potassium, sodium, calcium, etc., are present in quantities so small that they do not exert any retarding influence whatever on the development of bacteria. In the case of potassium sulfocyanid, however, the temptation is great to attribute to it an antiseptic action, just as it was formerly believed to be the cause of the toxic effects of the saliva.

Among others, Florian (*Gaz. méd. de Paris*, 1889, p. 317), who found potassium sulfocyanid constantly in saliva in amounts ranging from 0.07 to 0.1 per thousand*, writes of it as follows: "A une dose aussi faible il ne peut détruire tous les microbes qui pénètrent dans la cavité buccale, mais il est capable d'en arrêter le développement et son action sur certain d'entre eux peut être plus complète."

Chouppe (1888) made the observation that plants watered exclusively with saliva began to wilt as soon as the earth

had become completely saturated, and died soon afterward.

Michel (*Deutsche Monatsschr. f. Zahnheilk.*, 1901, p. 257) also considers potassium sulfocyanid as a natural protection against caries; while Hugenschmidt (*DENTAL COSMOS*, October, 1896) designates its antiseptic action in saliva as exceedingly weak, if not utterly wanting.

In view of these conflicting opinions relating to the antiseptic action of the sulfocyanid, it became necessary to again subject the question to the test of experiment. My tests were made in the first place in the customary manner, the substance being added to bouillon cultures of a caries bacterium in concentrations varying from 1:1000 to 1:8000. In this concentration it did not show the slightest retarding influence upon the development of the cultures, and I was obliged to use much stronger concentrations in order to produce a decided influence. I have observed a fair development of bacteria even in 4 per cent. solutions of potassium sulfocyanid in bouillon. In view of these results the possibility of its having any antiseptic action whatever in the mouth, where its greatest concentration does not exceed 1:8000, seemed absolutely excluded.

Here, however, the question arises whether this substance may not produce effects in combination with saliva which do not manifest themselves in solutions of bouillon. In order to test the action of the sulfocyanid in its natural solvent, the saliva, I added it directly to the saliva in such quantity as to produce concentrations varying from 1:5000 to 1:250 (this in addition to the amount normally present). To each tube I then added 0.1 gm. of peptone and 0.1 gm. of grape sugar or pulverized bread. Tubes prepared in this way, along with the control tubes to which no sulfocyanid was added, were placed in the incubator and were tested after twenty-four and forty-eight hours with respect to the amount of acid produced. The first group of experiments resulted as follows:

*These figures are quite inaccurate; the amount really varies from mere traces (say 0.001) to 0.125 per thousand.

Amount of acid formed.

	I	II	Total.
Control tube	7	10	17
“	7	10	17
Sulfocyanid 1 : 2000	7	10	17
“ “	7	10	17
“ 1 : 1000	7	8	15
“ “	7	8	15
“ 1 : 500	5	7	13
“ “	6	6	12
“ 1 : 250	5	2	7
“ “	4	6	10

Further experiments carried out in the same way gave results which were in part still less favorable for the sulfocyanid. In one case in which it had been added in proportion of 1: 250 as much acid formed on the second day (*i.e.* the fermentation was as intense) as in the control tube which contained no sulfocyanid. From these experiments we conclude that the presence of this substance in the saliva in the proportion of 1: 1000 may have a slight retarding effect upon the development and activity of bacteria; since, however, this percentage is eight times as high as the highest found in human saliva, we must regard these experiments also as negative in their results.

SULFOCYANID NOT ANTISEPTIC.

Still further experiments of a somewhat different character were made, the results of which no less plainly speak against any protective action of the sulfocyanid. To the saliva of an immune which contains the highest percentage of the sulfocyanid I have ever observed (1: 8000), I added still more in the proportion of 1 : 2000 so that the total percentage amounted to 1 : 1600. After adding peptone and sugar I filtered the saliva through paper and inoculated it with *Bac. prodigiosus*. The number of germs in a loop of the saliva, kept at room temperature, was found to be as follows:

Number of bacteria: At the beginning, 285; after 1½ hrs., 410; 1¾ hrs., 580; 4 hrs., 1048; 24 hrs., absolutely innumerable—computed at 1,000,000.

We see that *Bac. prodigiosus* had increased with enormous rapidity in the saliva, notwithstanding the fact that it contained five times as much sulfocyanid

as is ever normally present. In fact, in a number of cases I observed that a more rapid development seemed to take place when a small amount of the substance was present in the saliva than without it.

The objection may be made to the above experiments which it is customary to make to all bacteriological experiments undertaken outside the living body, that the conditions do not correspond to those naturally present in the human mouth. It might well be supposed that living saliva in the mouth possesses properties which do not manifest themselves in the test tubes. Such suppositions are reasonable only so far as they relate to the process of phagocytosis, which, while it may be active under certain conditions in the mouth, must of course cease soon after the saliva is removed. On the other hand, we know that those substances which impart bactericidal properties to normal human blood serum, as well as those which bring about artificial immunity, manifest their action just as strongly in the test tube, and sometimes even more strongly than in the living body. As far as the processes of fermentation in the human mouth are concerned, the conditions under which they take place so nearly approach those which may be produced artificially that an objection to the validity of the results can hardly be made on this score.

EXPERIMENTAL TEST IN THE LIVING MOUTH.

In order, however, to determine whether processes of fermentation in the incubator in reality bring about different results from those which take place in the mouth, the following experiments were carried out:

In the upper denture of my own mouth one molar is wanting on each side. I constructed two plates in which the spaces caused by the loss of the teeth were filled out with rubber. In this rubber two holes were bored, the one on one side opening on a level with the morsal surface of the teeth, that on the other side opening toward the gums. The holes were about one-quarter of an

inch deep and one-sixth of an inch in diameter. At 9.30 o'clock in the evening these holes were filled with foodstuffs, and one of the plates put into my mouth and the other into the incubator (naturally in a moist chamber, to prevent drying by evaporation). The following morning at about 9.45 the contents of these holes were tested with reference to their reaction. The examination showed that the contents of the cavity opening free into the mouth had a less marked acid reaction than that of the corresponding cavity kept in the incubator,—which of course is easily to be accounted for, since the presence of the plate caused a rather free flow of saliva, by which any acid formed must have been diluted. This was especially the case in the superficial layers, while at the bottom of the cavities the difference in the reaction was much less pronounced. The contents of the cavity opening toward the alveolar margin also showed superficially a slightly less pronounced acid reaction than that of the

corresponding cavity in the incubator, while in the deeper parts no appreciable difference could be detected. A difference in the process of fermentation inside and outside of the mouth exists accordingly only in so far as a dilution of the products of fermentation is brought about by the saliva. This difference will be marked enough in the superficial layers in the case of cavities opening free into the mouth, whereas in cavities to which the saliva does not have free access, especially in their deeper parts, the difference will be very slight or entirely wanting.

As a further experiment, little linen bags, about the size of a pea, were filled with foodstuffs and tied to my teeth on going to bed, while similar ones were suspended in flasks in the incubator. Here there was a marked difference, readily accounted for by the fact that the liquid contents of the bags were repeatedly forced out by the pressure of the cheeks and tongue.

(To be continued.)

THE "A B C" OF CROWN AND BRIDGE WORK.

By FRED. A. PEESO, D.D.S., Philadelphia, Pa.

THE subject of Crown and Bridge Work, while not new, is of great interest and importance to the dentist, and is becoming more so every day. There is perhaps no branch, however, which is so little understood and in which there are so many failures. It is unfortunately true that a great deal of the work which is done is ill conceived and poorly constructed. Such work is justly condemned and does more to bring crown and bridge work into disrepute than anything else.

It is unquestionable that the general health of the patient is greatly affected by the condition of the teeth. Facial neuralgia is almost always caused by diseased teeth or roots, and when this is the case it will entirely disappear on their removal or proper treatment. Dyspepsia and indigestion are largely due

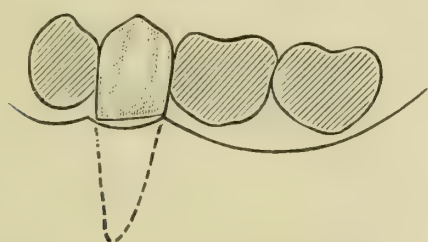
to the same cause, together with a lack of a sufficient number of teeth to properly masticate the food; but the disease will often disappear after the application of a proper form of denture, or the restoration of normal masticatory functions. Where crown and bridge work is clearly indicated and skillfully done it is of the greatest value to the patient, and there is nothing which will take its place; for, of all means yet devised, it approaches most nearly to a perfect substitute in form and function for lost dental organs. Where the reverse obtains, of all forms of dentures it is the worst, and will be a source of discomfort and perhaps danger to the patient, and of annoyance to the operator.

SELECTION AND PREPARATION OF CASES.

In all operations, of course the first thought is for the interest of the pa-

tient, and bridge work should never be recommended unless the dentist is positive that no other form of denture would serve as well. Each case should be carefully studied as to its suitability for bridge work, and to that end care must be taken to see that the teeth or roots are in proper position, good condition, and sufficiently strong to do the work imposed. If the roots or surrounding parts are diseased they must be brought to a healthy condition before proceeding with the work. If this cannot be done, the idea of bridge work must be abandoned. A loose or an abscessed tooth, or even pyorrhea alveolaris, in its primary stages, need not necessarily preclude the placing of a bridge. These diseases can be successfully treated, but the prosthetic work should be postponed for a sufficiently long time to be certain of the cure.

FIG. 1.



Properly treated, a tooth will do far more work than it was originally intended to do. Good judgment must be used, and too much strain must not be put upon a single tooth or root; but how often it happens that the only question considered in connection with this work is the amount of money that can be gotten from the patient, and no thought is given as to the amount of work which a tooth will endure. It is no uncommon thing to find cases where a dentist has undertaken to make a single tooth carry two, three, or even more teeth, as illustrated in Fig. 1. This is not a supposed case, but one which was actually put in the mouth, and is only one of many as bad or even worse.

Ordinarily, two good sound roots will sustain a bridge of four and at times even five teeth, including the abutments,—but this subject will be treated in its proper place.

We will now take up the most important part of this whole work,—in fact

the vital point, and about which there has been the least written:

THE PREPARATION OF THE TEETH AND ROOTS.

It is probably not exaggerating to say that in ninety per cent. of the cases put in the mouth the work is not done at all as it should be done. It is to be supposed that in most instances the dentist is honest and thinks he has done the work properly; but a careful examination will show that the tooth might as well not have been trimmed at all, just enough structure being removed to allow the passing of the band between it and the adjoining tooth, or, if the tooth is somewhat broken down, there has been no pretense made to trim it. If more time and study were given to the subject there would be better results. All too frequently there is carelessness and indifference on the part of the operator, the only object being to get the work out of the way in the shortest possible time and to pocket the fee.

All conditions being satisfactory, success depends almost entirely on the preparation of the abutments. If these are not properly prepared the result will be a disappointment to all parties concerned, let the prosthetic work be never so well done. Almost every failure can be traced to this source, and too much care and study cannot be given to this phase of the subject. Other parts of the work might perhaps be slighted without serious results, but this never, if the work is to be permanent. Some years ago an article appeared in one of the dental journals in which it was said, "If bridge work lasts three or four years it is all that can be expected of it, and the dentist has fulfilled his obligation to his patient." This is most pernicious teaching. If the work should last no longer than that it would be a most decided failure. There is almost no limit to the life of the work when properly done, and it should be as good after having been used for years as when first put in the mouth. This is the rule and there should be very few exceptions to it, and these will grow less as the details of the work are more thoroughly understood.

The trimming of a tooth may seem to be a simple operation, but it is by no means so. It takes time to do it properly, and this time must be given; if it cannot, it is better not to do it at all, or to complete the operation at some future sitting. The dentist should be conscientious in using his best efforts to do this, and there will then be no cause for regret. He should learn to do the work thoroughly if it take all day to trim a tooth; facility will come with practice.

TECHNIQUE OF PREPARATION IN DETAIL.

We shall now undertake to describe in detail the preparation of the teeth, beginning with those to be prepared for the reception of full gold crowns, either single or to be used as abutments for bridge work.

It is an excellent plan for the beginner to take a number of extracted teeth, trim them carefully and observe and remember their form. He should not confine himself to a single tooth of each kind, but take several and note any variation from the typical shape. It is time well spent and will repay him in the end. The operator should always have in mind what the shape of the tooth would be if cut off about one-sixteenth of an inch below the gum line, and the swell or contour must be entirely taken away, leaving the sides of the tooth parallel, or slightly larger at that point. The forms of the teeth are varied, and if the typical shape of each tooth is kept in mind, it will be of great assistance in their preparation.

We will take first the lower molars. Viewed from the buccal side, the contour is very great. Starting just below the gum line it swells outward, until at the point of contact with the adjoining teeth it is from one-quarter to one-third larger than at the neck. Viewed from the occlusal surface it is oblong.

These teeth when properly trimmed, are nearly square in shape, with the corners rounded, being slightly broader on the mesial side and nearly flat, while the distal side is somewhat convex. This is owing to the difference in size and shape of the roots. The buccal and lingual sides are nearly straight, with a

slight depression near the middle, from the bifurcation of the roots. (Fig. 2.)

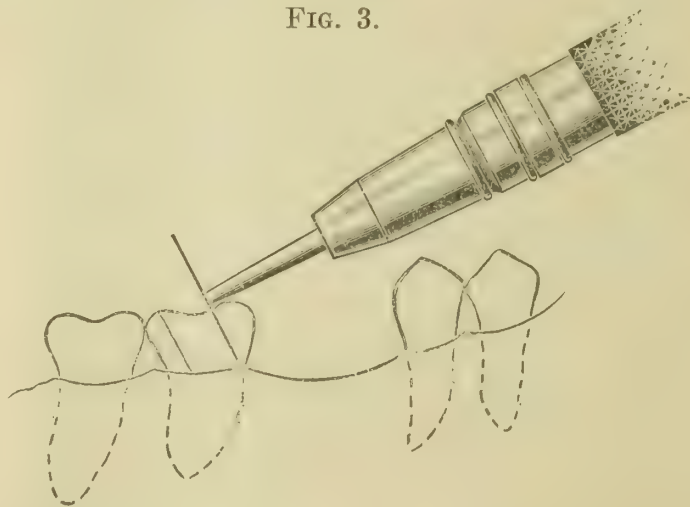
FIG. 2.



This description will apply more especially to the first and second molars, the third molar being subject to greater variation than the others. These are perhaps the most difficult teeth in the mouth to trim, and require a great deal of patience and perseverance on the part of the operator.

The bulk of the cutting in these, as in all the teeth, will be on the mesial and distal surfaces, the contour being greatest at these points. This contour must be entirely removed to a point about one-sixteenth of an inch below the gum line, so that the band when passed over will hug the neck of the tooth tightly and will not impinge upon the gum. For this work, it will be necessary to use a diamond, or thin corundum or carborundum and rubber disk. On these surfaces it is not possible to do the cutting properly with a straight disk, as to get below the gum line would necessitate cutting far back toward the center

FIG. 3.



of the tooth from the mesial side, while on the distal the contour could not be removed without cutting deeply into the root under the gum, leaving an objectionable ledge and the tooth far out of parallel with an anterior abutment, if it is to support one end of a bridge. (Fig. 3.)

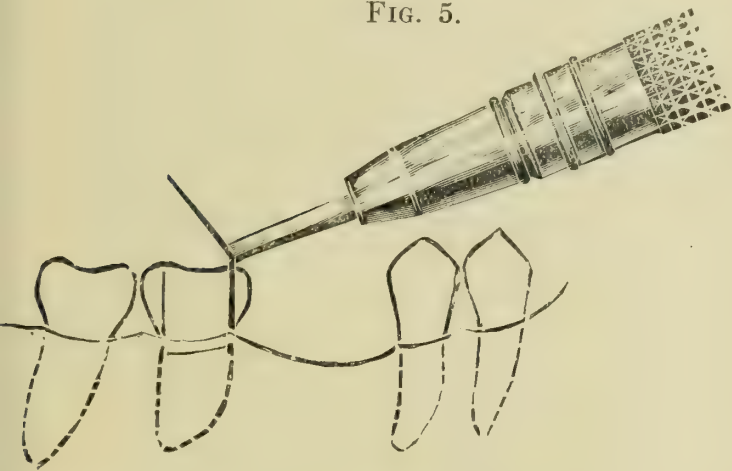
With a cup or a saucer-shaped disk the work can be easily accomplished by first cutting through between the teeth and gradually grinding away the contour on the mesial side with the face of the wheel, and on the distal with the reverse side, or by cutting away the whole

FIG. 4.



amount at once. In the latter case, with a rather strong, curved explorer (Fig. 4) the surfaces are examined well below the gum, to determine how much it will be necessary to remove. The edge of the wheel is placed at the proper point on the masticating surface and the whole contour may be taken away with one cut, using plenty of water and holding the hand and instrument very steady. This is a much quicker way than the one first mentioned, and there is less liability of injury to one of the adjoining teeth. (Fig. 5.) Where through the breaking

FIG. 5.

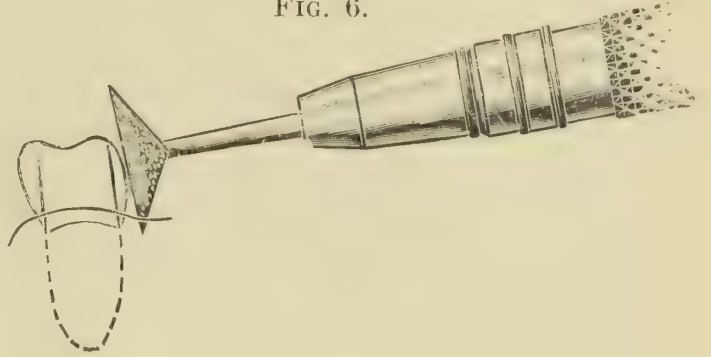


down of the tooth-structure or from any other cause there is very little to cut away, it is well to use a safe-sided disk, but these disks will not cut on the edge as the others do. For the buccal and lingual sides, when using the straight handpiece, a thin flat disk, either diamond or carborundum, and an inverted cone may be used. These should be from three- to five-eighths of an inch in diameter.

Most of the cutting here will be on the lingual side, as these teeth generally lean in toward the tongue. The trimming of these surfaces is most easily

done from the side on which the tooth to be trimmed is located. If it be on the right, the operator should stand on

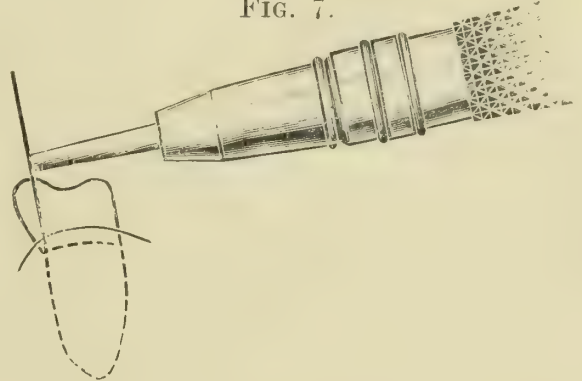
FIG. 6.



that side; if on the left, he should stand at the left of the patient.

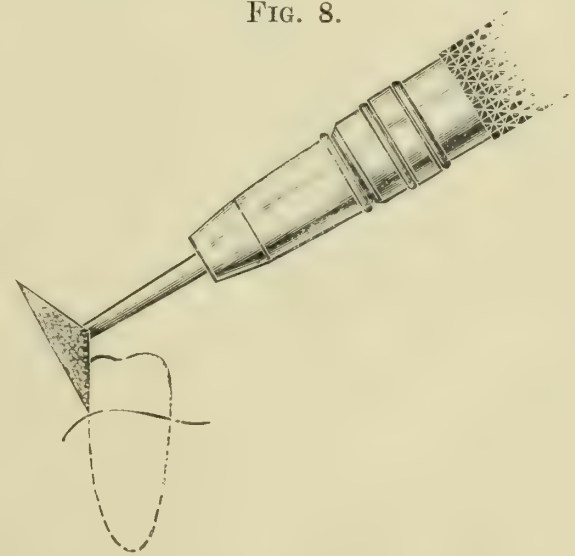
The buccal side can be ground with the face and the lingual with the reverse

FIG. 7.



side of either the flat wheels or the inverted cones. (Figs. 6, 7, 8.) The anterior buccal corner can be nicely rounded to the desired distance under

FIG. 8.



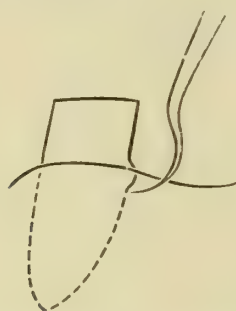
the gum with the inverted cone or disk, using the face and rotating from side to side, as in Fig. 6; the posterior lingual with the reverse side of the same wheels,

as in Figs. 7 and 8; while for the posterior buccal the inverted cone will have to be used from the opposite side of the mouth.

The anterior lingual corner is the most difficult of any to get at, but most of this can be taken away with the face side of the cup-shaped wheel, Fig. 5, rotating it from the opposite side of the mouth. Very coarse emery-cloth disks are of great use in finishing the corners, their flexibility being a great point in their favor.

With the right-angle handpiece, small diamond disks from three- to five-eighths of an inch in diameter will be found very useful, especially for the corners. In some places that cannot be reached with wheels or disks the corners or ledges can be removed with enamel cleavers or scalers. The No. 3, S. S. W., or the

FIG. 9.



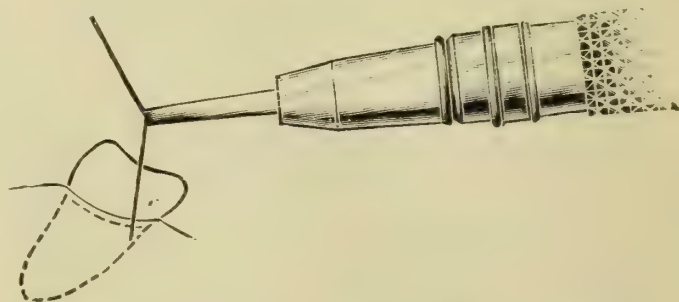
same scaler with one safe-edge, made in rights and lefts, may be used. The explorer should be constantly employed to detect the slightest irregularity, sliding it down the face of the tooth (Fig. 9), and the least shoulder or ledge must be removed, so that when the band is passed over the tooth and under the gum it will hug the neck tightly. A fissure or a finishing bur can often be used to advantage where it is next to impossible to reach with anything else.

PREPARATION OF INCLINED TEETH.

A condition frequently met with in the mandible where the first molar has been lost is the pitching forward of the second, so that the only point of occlusion is at the distal cusps. In a case of this kind there will be little or no cutting on the distal side of the tooth; but on the mesial at the masticating surface it would necessitate cutting far back

toward the center of the tooth in order to make it nearly parallel with an anterior abutment to a point sufficiently below the gum line, which in this case should be greater than where the tooth stands in a normal position; for here, if the band happens to be a little long, it would cut into the tissues and the result

FIG. 10.



would be as bad as though the tooth had not been trimmed at all. (Fig. 10.) The cup-shaped disks are here used in the same way as in the former case. The lingual and buccal sides and the corners would be treated in the manner already described.

Where there is an excessive inward leaning of the tooth toward the tongue, as in Fig. 11, there will be no cutting at all on the buccal side, but a great deal on the lingual, the most of which can be taken away with one cut with a thin disk. Here, too, there should be rather more trimming than where the tooth sets straight.

FIG. 11.



It is far better to trim too much than too little. If a tooth be cut away more than enough to remove the contour there is no particular harm done. The band can rest on the ledge or shoulder and the cement may be entirely removed, so that there will be no irritation (Fig. 12), but if enough has not been taken away, when the crown is in place the band will cut into the gum and the cement present a rough, jagged surface to the soft tissues, causing irritation and inflammation which will eventually result in the

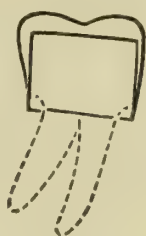
loss of the tooth. (Fig. 13.) Unfortunately, this is a condition all too frequently encountered.

The bicuspid are trimmed in the same manner as the molars, but in most

FIG. 12.



FIG. 13.



cases a straight or flat disk may be used. The point of difficulty here, as in the molars, is the anterior lingual corner. It is, if anything, harder to reach and will have to be trimmed almost entirely with scalers or with an instrument made specially for the purpose. At the masticating surface enough of the tooth should be ground away to admit of placing a strong, thick cusp, especially where it is to serve as a support for a bridge. This can best be done with a very coarse-grit square-edged wheel.

The shape of the upper molars is very different from that of the lowers. Observed from the masticating surface they are somewhat diamond-shaped with rounded corners, the greatest diameter being from the anterior buccal to the posterior palatal corner. (Fig. 14.)

FIG. 14.



This is generally true of the third molars, but these teeth are subject to more frequent variation than the others.

The typical form of the upper molars, after being prepared, is nothing like the lower. It is somewhat triangular in shape, with the long side toward the mesial aspect. It is broader at the buccal side than at the palatal, owing to there being two buccal roots and only one palatal. There is a depression on the buccal side between the two roots and generally on the distal side between the posterior buccal and palatal. (Fig.

15.) This shape may vary at times and the palatal be as large or even larger than the two buccal roots, but this is an abnormal condition and will readily be discovered by the use of the explorer. It infrequently happens that the first or second molars will have but two roots, and when this is the case they will both be of about the same size. Very rarely they may have but one root. The third molars are more uncertain, as there may sometimes be but one, and at other times several roots.

The trimming of these teeth is much easier than of the lower. The bulk of

FIG. 15.



the cutting will be on the anterior palatal portion (Fig. 15), the greater part of which can be taken away with one cut, as already described. The use of the cup-shaped disks and inverted cones is here indicated, and the operator will readily discover where each can be used to the best advantage. The coarse emery-cloth disks will be found almost invaluable in getting around the corners, especially the posterior buccal and palatal. The scalers will be found useful, particularly at the buccal and posterior depressions. It is much easier to use them here than on the lower molars.

The bicuspid are trimmed in the same manner as the molars, most of the cutting being on the mesial and distal sides. Generally this will be a little greater on the mesial side. After being prepared these teeth are somewhat egg-shaped, being long and narrow from the buccal to the palatal side, broader at the buccal, and generally having slight de-

FIG. 16.



pressions on the mesial and distal sides. (Fig. 16.) It is very seldom that a full gold crown should be put farther forward in the mouth than the second bi-

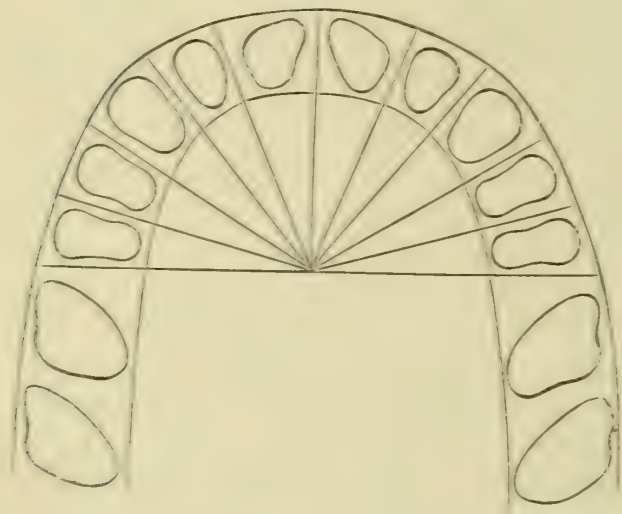
cuspid, on account of its conspicuousness. Where the patient is a man with a mustache or beard which will hide the gold it is permissible to place a gold crown, but in the case of a woman, or of a man where no beard is worn or the lip is so short as to render the crown plainly visible, it is better to cut the tooth off and put in a Richmond or a porcelain crown. Gold in the front of the mouth is an abomination and should always be avoided if possible. It is almost criminal to put a gold crown on any of the six anterior teeth, and will do the dentist more harm than good among the better class of patients, for it will advertise him as a man of very poor taste, to say the least.

THE ANTERIOR TEETH.

We now come to the eight anterior teeth. All crowns for these teeth should be of porcelain, or porcelain-faced, and the method of their preparation is somewhat different from that of the others, the work being done almost entirely with enamel cleavers and scalers.

The typical shape of the upper roots anterior to the molars, the centrals

FIG. 17.



excepted, after being prepared is oval with some slight variations, being broadest at the labial side and narrow at the palatal. This must of necessity be the case in order that they may be properly accommodated in the arch. (Fig. 17.)

The first bicuspid is shaped very much the same as the second, the depressions on the mesial and distal sides being perhaps a little deeper, as there are two

roots to this tooth while the second has but one root. Sometimes it may happen that the first will have but one and the second two, but this is very rarely the case.

The shape of the canines and laterals is almost a true oval, but the centrals, while having something of the same character, are more distorted, being somewhat triangular in shape. The longest side of the angle is on the mesial and the shortest on the distal side of the tooth. The labial side is somewhat flattened and generally inclines outward toward the median line, while the mesial sides are apt to diverge toward the palate, leaving a V-shaped space between them.

The preparation of any of these teeth for the reception of porcelain or Richmond crowns is far easier than to prepare a tooth for a full gold crown; but here the same want of skill, or utter carelessness, prevails as in the case of the latter, and as often as not there has been no pretense made to trim them at all. The roots, instead of being cut far enough under the gum to hide the band, are left long, so that there is from one-sixteenth to one-eighth of an inch of gold showing, while the sides have not been touched. This is true of a large percentage of the work which is done, and it is not probable that this assertion will be questioned by many dentists.

In preparing these teeth they should not be cut to or below the gum line, but left about one-sixteenth of an inch above it until after the root has been trimmed and the band has been fitted. There are several reasons for this: Where the tooth has been cut too low at the beginning, the gum crowds over the edge of the root and has to be pressed away every time the instrument is applied. This causes excessive bleeding of the gum, which interferes with the vision of the operator and renders the proceeding more difficult and uncertain, and makes the fitting of the band a disagreeable and bloody operation, besides being a much more painful one to the patient. Where the root is left a little above the gum the sides serve as a guide for the instrument in trimming, there is less

bleeding, less pain to the patient, and the band is far more easily fitted to the stump.

In trimming these teeth it will be found that the greatest diameter of the root is at the point of junction of the enamel with the dentin. (Figs. 18, 19, and 20.)

REMOVAL OF ENAMEL.

The enamel must be entirely removed, and if this removal be properly done, unless there has been a recession of the gum, the root will be found to be of the proper shape for the reception of the band (Fig. 20), which should take the place of the enamel and fit the root tightly, so that if from any cause it were found desirable the crown or bridge might remain in the mouth for several

FIG. 18.



FIG. 19.

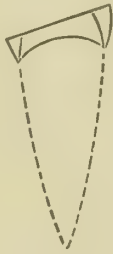
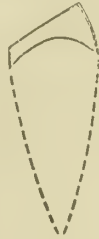


FIG. 20.

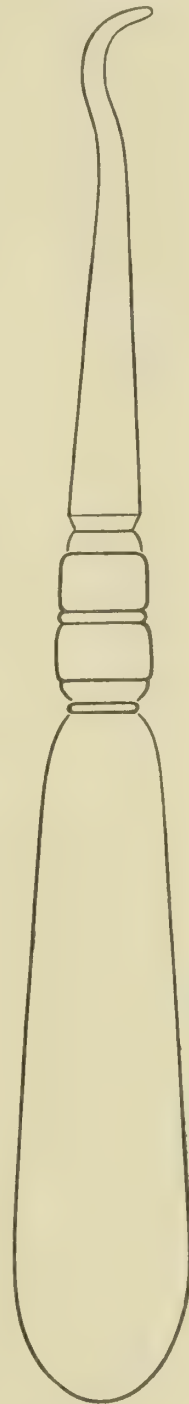


days without cementing, being held in place only by its perfect adaptation to the roots.

For removing the enamel, the enamel cleavers and scalers are best adapted. On the mesial and distal sides the thin disks can often be used to advantage. For the labial side, the No. 3 scalers, or the safe-edged ones are the best, as the curve of the instrument adapts itself to the root nicely. These instruments should have a short, strong, heavy handle, so as to afford a sure grip with the hand. The S. S. W. cone-socket handle 8A is the best. (Fig. 21.) It should be grasped firmly, something in the same manner as a knife is held in sharpening a lead pencil, the end of the thumb resting on the adjoining tooth or root, or on the thumb or finger of the other hand held in such a manner as to give support and steadiness in using the instrument.

Then, by a slight opening and closing movement of the hand, as in sharpening a pencil, the thumb being held rigid and the instrument pressed to the side of the tooth, the enamel can be removed with the least possibility of injury to the patient. The instrument should be held so that there is no chance of its

FIG. 21.

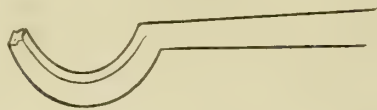


slipping, or, if it should slip, it cannot go far enough to cut the cheek or lips. For the approximal sides, where the teeth are very close together, the No. 7 scaler will be very useful.

It generally happens that on the palatal side of the six anterior teeth at the basal ridge, the enamel, which

is here very thick, seems as though welded to the root and it is next to im-

FIG. 22.



possible to remove it. It is here that the enamel cleavers will come in play. With them, or a broken scaler, ground so as to give a strong, sharp cutting edge (Fig. 22), the enamel can be broken down and loosened, and afterward the perfect scaler can be used to remove any irregularities and smooth the side of the root. Sometimes it will be necessary to use a very small diamond or carborundum wheel at this point before anything can be done with the scalers. Where the gum has receded beyond the edge of the enamel, the root is trimmed

in the same manner, the sides parallel or sloping slightly outward to a point a little under the gum line.

The cutting down of the roots and the opening and enlarging of the canals will be treated of when we come to describe the making of the different kinds of crowns.

The roots of the lower anterior teeth, just below the gum line are oval, the

FIG. 23.

FIG. 24.

FIG. 25.



bicuspid short and thick (Fig. 23), the canines a little longer (Fig. 24), and the incisors long and narrow (Fig. 25). They are trimmed with scalers the same as the uppers.

(To be continued.)

COMMENTS ON PORCELAIN FILLINGS AND ELECTRIC FURNACE CONSTRUCTION.

By WM. LEON ELLERBECK, D.D.S., Salt Lake City, Utah.

(Read at the annual meeting of the Washington State Dental Society, at Tacoma, Wash., May 23, 1902.)

THE operation of filling carious cavities with porcelain and restoring broken tooth-corners with this material is considered by many as being impractical and deemed to be a fad which will be short-lived.

It is but natural that those not schooled or skilled in this branch of dental art and science should be the ones most concerned in questioning and berating its merits. Some dentists will openly criticize one for using the material. Careful inquiry, however, usually reveals the fact that the person indulging in the criticism has inserted but few, if any, porcelain fillings made by the more recent methods,—often the most biased never having seen one. Unfortunate it is that men will venture such criticism without first having investigated, standing in their own light, while they disfigure their all-trusting

patients and perhaps bias some of their brother practitioners, who in turn may, through their influence, fail to investigate and in consequence continue in ignorance of the real facts because "They say porcelain fillings will not last." In the language of Dr. E. C. Kirk, "That man 'They say' is the most notorious liar on the continent, and should be suppressed." Truly, "They say" is making a strong endeavor to down porcelain work. But this is to be expected. Many years ago when two Frenchmen crossed the Atlantic and began mutilating Uncle Sam's coin with a bastard file and sold the product thus produced under the title of "The Royal Mineral Succedaneum," which, combined with mercury, they advocated as a tooth-calcer, they rendered a service to mankind; the outgrowth of their contribution to the dental world,—viz,

scientifically prepared amalgam alloy,—could not well be dispensed with; yet many there were to condemn the use of amalgam as a practice barbarous and dangerous. The amalgam war is a thing of history, but history repeats itself, and the porcelain war is on. The first amalgam introduced had imperfections; it is only of recent years that these imperfections have been overcome. The first porcelain bodies introduced had imperfections; they have been largely overcome.

Methods at first were crude. Careful thought and experimentation have refined them, and a new era has begun. Careful discrimination in the use of amalgam is essential to-day. Likewise discrimination and good judgment must be exercised in the use and manipulation of porcelain.

In commenting on the technical procedures for the preparation of teeth for porcelain fillings and the preparation of the fillings to be inserted, one can hardly hope in the light of all that has been published, to present much that is original, nor yet always to give credit for originality where credit is due. At any rate such is not my intention, for I make no special claims to originality, my chief purpose being to state my beliefs, gained from observation and practical experience, as a testimonial and encouragement to those who have refrained from working in porcelain because of an unwarranted or unfortunate bias.

THE ESTHETIC ELEMENT.

Dr. B. Holly Smith, in his recent paper entitled "Esthetics in Dentistry," made the unique comment, "It is unfortunate that an otherwise pleasant smile should be marred by the glamor of gold." Truly it is unfortunate, for there is an eternal fitness of things, and gold in the anterior teeth, while perhaps fitting, is yet not fit. The oculist, should one of his patients unfortunately lose one of his visual organs, would hardly think of inserting a gold eye. The tonsorialist would hardly supply a bald pate with a wig of excelsior packing,—certainly not; both would endeavor to imitate nature. The dentist's duty is

clearly in the same direction, and gold is inharmonious, to say the least. Often we see women beautiful but for the misfortune of a peg lateral or a glamor of auriferous plugs, which detract from an otherwise harmonious and pleasing countenance.

The real extent of the unnecessary handicap under which they are placed is often not fully realized until a porcelain crown scientifically and artistically constructed replaces the peg and the gold stoppings have become an asset for the dentist, porcelain fillings having been inserted in their stead. Truly the esthetic value of porcelain cannot be denied. In the minds of some its practicability remains to be proved; but let us consider that the "extension for prevention" advocates now comprise an even number, if not a majority, of the scientific and thinking element of the profession. While circumstances may occasionally modify the practice, the advice of Black, viz, to "cut to the areas of immunity," is sound, and on the ground of doing the greatest good to the greatest number should be practically indulged in.

Many prominent in the profession, whilst conceding the soundness of the principle, yet refrain, particularly in front tooth work, for esthetic reasons. The recent perfection in dental ceramics has deprived them of their last excuse. The cutting away of the tooth-structure to reach free cleansing surfaces is warranted as being a good prophylactic measure. Artistic porcelain operations fill all the requirements from the standpoint of esthetics, and as to permanence the principle of cavity extension, which for porcelain is from every standpoint warranted, is a factor in their favor. The further argument, that under fillings held in place largely by adhesion the occurrence of secondary decay is so much more readily discovered and therefore more easily combated than under fillings largely dependent upon concavity for retention and which remain *in situ* notwithstanding a recurrence of considerable decay, which often progresses to pulp-infection before the patient is

driven to the dentist for relief, is proof that porcelain fillings have come to stay.

CAVITY PREPARATION.

As to the methods of their construction and the preparation of cavities for their insertion, so much has been written by men known to be competent and experienced that a detailed description is unnecessary and unwarranted; suffice it to say that the general principle of cavity preparation as systematized by Black should be observed, so far as relates to proper extension, and in approximal decays involving the incisal edge the cavity should be so prepared that the force of mastication will tend to drive the filling in, not out. The thin Leaming disks made of carborundum and rubber, for sale by the Consolidated Company, are valuable for quickly shaping the cavity outline. The stiff, fine-grained shellacked-back garnet disks made by The S. S. White Company are equally well adapted to the purpose.

The margin of the tooth-walls should be left well defined, the further concavity in the tooth-substance being produced by burring, care being taken to avoid jaggings the sharply defined edge of the enamel wall. When irregularities exist on the labial or palatal aspect and jut into the cavity margin, they should be dressed down by garnet and finally by cuttle disks, until perfectly smooth.

Where approximal cavities extend well toward the incisal edge and the latter is very thin, there being no dentin left to insure strength, it should invariably be broken down, for the reason of its liability to fracture and because of the liability of the necessarily thin, friable porcelain horn fracturing during its insertion; and again, the removal of the matrix in these cases is difficult to accomplish without distortion, and a perfect fit, therefore, is hard to procure. Where the incisal edge is thick and measurably strong the simple cavity may with impunity be filled as such, for the incisal porcelain horn is correspondingly stronger, and the cement can be counted upon as affording still further strength to both tooth and porcelain. Where it

is deemed best to sacrifice the corner, a thin-bladed chisel is used to break down a small portion, enough to permit a garnet disk to pass between the teeth, after which it is, as a rule, best to depend upon the disk, which, if it be a pliable garnet disk, is held against the tooth slanting from the incisal angle toward the opposite gingival angle, and if it be an upper incisor, is held so that the palatal aspect is cut in excess, the labial wall extending farthest laterally; for the force of mastication is upward and outward, and the labial wall should be made to resist the outward force, whilst the upward force is taken care of by preparing the cavity so that there will be a broad base at the gingival aspect.

The preparation of such a cavity in most instances is to the experienced and artistic worker only a matter of five or ten minutes, the making of a matrix five or ten minutes more, and fifteen minutes for baking and dressing leaves ample time for cementing and discharging well within the hour; thus the patient, having been spared an ordeal of pounding and an agony of polishing, and being withal the possessor of an artistic, invisible, and, if properly made, enduring filling, leaves the office in a happy frame of mind and with only words of commendation for the dentist.

THE MATRIX.

Simple approximal cavities and approximal cavities involving the incisal edge are in the main the easiest cases that present. In both cases a strip of 1-1000-inch platinum foil, at least an inch in length and wide enough to extend well beyond the cavity margins, is used for making the matrix; presuming, of course, that the high-fusing porcelains are to be used.

When the incisal edge is involved and a contour necessary, the foil should lap at least an eighth of an inch beyond the incisal edge, and a line beyond the gingival cavity border. With a smooth, flat-blade, plastic plugger the platinum should be worked under the gum septum far enough beyond the gingival cavity

border to guard against the possibility of the edge being drawn within the cavity, or being broken through during the burnishing. The ends of the platinum should be bent to embrace the tooth to be filled and to lap on the adjoining one, where it can be firmly held by the thumb and finger not engaged in burnishing.

It is a mistake to attempt to economize by using a small piece of platinum foil, as time may be saved and a better matrix made by using a piece long enough to insure stability, which will prove the only real economy by being productive of more uniformly good results.

A burnisher, preferably a perfectly smooth cylindrical one, such as No. 23 of The S. S. White Company series, is used to burnish the foil against the cavity margins, after which, before burnishing into the cavity proper, the finger is made to smooth the platinum along the incisal edge, the fold occasioned being pressed tightly against the tooth, making a more or less substantial framework which tends to strengthen the matrix and resist distortion. The burnisher is again employed to define well the cavity margins,—burnishing thin the platinum foil, particularly near the incisal angle, where there may be some folds; here is a difficult point, and the burnishing must be rigorously prosecuted. The beginner will find that his fillings are prone to stand out from the tooth at this place. I am inclined to the belief that it is due as much to insufficient burnishing at the incisal angle as it is to distortion caused by the shrinking of the porcelain body. Notwithstanding the advice given by some to avoid the use of ball burnishers, I should recommend that a perfectly smooth one of large size, such as The S. S. White Company's No. 31, be used wherever possible for first spinning out the platinum within the cavity, spunk or cotton being subsequently employed.

In the case of the cavities just cited, little difficulty is experienced in removing the matrix. In making the matrix for simple approximal fillings one is occasionally cautioned by some writers not to permit the end of the platinum

to overlap very far the cavity margins, because of the difficulty in removing the matrix. I take exception to this advice and should use a piece long enough to secure stability. If any difficulty be experienced in its removal, wedge the platinum in the cavity with a piece of spunk, and hold the foil against the cavity margins with an orange-wood stick or the thumb-nail. The long end of the platinum may be bent back and snipped off quite close to the orange-wood with a thin knife blade, such as the Gardiner trimmer No. 1. The platinum may be cut away as close to the cavity margin as may be required, the matrix in the great majority of cases being easily slipped within the arch.

COMPLEX CASES.

Cervico-labial cavities extending well under the gum margin and compound labio-approximal cavities are by far the most difficult cases that present, the latter particularly to the beginner seeming well-nigh impossible to fill because of the difficulty experienced in procuring an accurate matrix. In cervico-labial cavities extending well under the gum margin the tendency for the platinum to spring and the difficulty encountered in covering the gingival cavity margin are two annoying features. In such cases the gum is forced back for a day or two, with white stopping, and as an aid the patient is instructed to press frequently on the filling until the date set for making the matrix and filling. In these cases, also, a long strip of platinum is desirable; a piece is cut a little wider than the tooth and long enough to reach from the gingival cavity border to a point well beyond the incisal edge. The foil should be held against the labial surface and gently pressed with a wad of moistened cotton, in order to get a general outline of the cavity border, which if sharp, as it should be, and not much beveled, will be readily defined on the platinum. The foil is then removed and with the curved floss-shears the gingival border is trimmed within a short distance of the gingival

cavity margin and made to conform with its general outline.

The amount of excess platinum permitted to extend beyond the cavity border, being proportioned to the extent of the gum flap, is readily determined by exploration. The foil should be worked gently under the gum and beyond the cavity margin, the lateral edges of the platinum in the interproximal spaces being folded slightly, making a sort of framework, thereby increasing the rigidity of the matrix, the platinum being less inclined to spring from place.

The burnishing should begin at the gingival border until the margin is well defined, after which the Woodward clamp can in many instances be used to hold the foil in place. The two points at times being permitted to penetrate the gum border, holding the platinum beneath tightly against the tooth, the long end of foil being lapped over the incisal and also held by the clamp near the labio-incisal edge and often against the platinum wall, perfect mobility is in most cases secured. The Meister clamps, having the small handles with which to spring them, such as sold by the Sibley Company, can also be used to advantage, care in either instance being observed, whilst removing the clamp, not to tear or drag the foil.

SHADING THE INLAY.

It would be rather presumptuous for one to give any set rules as to the shade of porcelain to employ in order to have the inlay harmonize perfectly with the tooth-color. Here, as throughout the whole procedure, one's intuition or perception figures largely.

The personal equation, as throughout the whole field of dental operations, is the prime factor in gauging the degree of success to be met with in porcelain filling operations. Perhaps more so in this class of work than in any other, for there is a constant expression of the artistic required, and the latter is one of nature's endowments by no means universally or profusely distributed.

It may be safe to state for the guidance of the inexperienced that in ap-

proximal cavities the real tooth-color is used in proportion as the labial surface is involved, being lightened, therefore, proportionately as the cavity is confined within the arch.

From the above it may be inferred that in purely labial cavities the exact tooth-shade is to be employed. This is, in many instances, true, but depends somewhat on the thickness of the inlay and whether or not the cervical cavity margin is hidden by the gum, and also on the color of the cement intended for the setting. Labial inlays not extending under the gum are by far the most difficult to make harmonize with the tooth-shade, for there is the problem of having to hide two edges, and there is more chance of contrast than where part of the inlay is hidden. In these cases, especially if the cavity is very shallow and in consequence the inlay is very thin, it is often necessary to use a porcelain much darker than the tooth-shade. To make sure, it is advisable to make a matrix for a test shade. The minute details, such as burnishing the foil to the desired thinness, may for this be overlooked. Fuse the inlay and insert, pressing it in the cavity, which has first been dried and partially filled with the cement powder to be used. The effect will give a fair idea of the ultimate shade which would have been produced had the inlay been inserted with the cement and the latter have been permitted to set. One may judge from the trial any change in shade necessary to insure an artistic operation.

I had hoped to be able to go over briefly the subject of porcelain crown construction and the application of porcelain to removable bridge-work; but as diagrammatic explanation would be necessary for accurate description, a lack of time precludes the possibility of my being prepared by the date set for the reading of this paper, should I touch upon this subject. I trust, therefore, to be excused for presenting instead a description of the construction of some simple but effective electric furnaces which can be made by anyone and which will answer admirably for all classes of

porcelain filling and porcelain bridge and crown work.

The cost of them is so trifling that one is justified in making them merely for the experience, particularly since they are valuable adjuncts to one's laboratory equipment, notwithstanding the equipment may already include the more costly furnaces sold by the different manufacturers. The cost of the inlay furnace will not exceed five dollars and the bridge furnace will cost about seven dollars and a half. If one is already supplied with a rheostat twelve dollars and a half will cover the expense of both.

THE CONSTRUCTION OF ELECTRIC FURNACES.

For an inlay furnace, first purchase from the chemists' and assayers' supply house a Rösé porcelain crucible two and one-half inches in length and about one and one-half inches in diameter. With a carborundum and rubber or a diamond disk, or by holding flat against a coarse corundum or carborundum wheel on the lathe, cut away the bottom of the crucible which has first been filled with modeling compound to prevent its being crushed. On each end of the crucible make thin cuts one-eighth inch deep and on the bottom edge an eighth of an inch or less apart, and enough wider on the upper edge, which is of greater circumference, to make the same number of cuts. Several feet of No. 28 platinum wire free of iridium, which latter tends to make it springy and hard to manage, is required for the wrapping, furnishing, as it does, the resistance to the electric current which is to induce the heat. Three or four inches from one of the ends of the wire make a small knot or kink to prevent the wire from slipping through the cut, and wind the wire back and forth within the crucible, catching it over the little porcelain pickets on the crucible edge, always bringing it back within the crucible. At the last cut tie another knot, or kink, to prevent the platinum from slipping. Leave the end at least six inches long; take a smooth porcelain capsule a couple of sizes larger than the one used for the muffle, so that

when the crucibles are nested there will be at least a fourth of an inch space between the crucible walls. Place the Rösé crucible, which has been wound with the platinum wire, within the larger crucible, the larger end first. Before doing this, however, place a layer of highly refractory but plastic fire-clay, mixed with water to a semi-soft mud, in the bottom of the larger crucible. Fill in between the crucibles with dry bone-ash, such as used by the assayer for making cupels, or, if available, calcined fire-clay may be employed. Fill to within about a quarter of an inch of the top of the crucible. Complete the filling with some of the first mortar, such as has been used in the bottom of the crucible. With the finger carefully smear some of the mortar over the wires within the muffle, barely covering them. Place the two crucibles thus luted on a pan over a small Bunsen flame and allow to slowly dry. In an assayer's crucible, of a size large enough to allow a half-inch margin beyond the circumference or the size of the outside porcelain capsule, place a wad of asbestos fiber which has been slightly moistened with very thin plaster of Paris. Nest the porcelain muffle in this, working the fiber evenly around it to within a quarter of an inch of the top, again place on the warming-pan and allow to dry, after which fill the remaining portion between the two crucibles with fire mortar. The furnace is then ready for its initial trial with the electric current. Connect the rheostat and turn to the first notch. When any signs of crackling begin, turn off the current for a few moments, allow it to cool, and gradually heat up the furnace to incipient redness and let it remain for ten minutes, when the current may be gradually increased. The outside crucible is round or conical, and of course would roll. To prevent this, imbed the crucible in plaster of Paris, a half-inch layer having been spread on any suitable support,—a brick being a suitable thing for this purpose. A mica door is used to cover the muffle opening when getting up heat. To obtain excessive temperatures a block of charcoal may be used, care being taken

not to let the platinum wires come in contact with the charcoal, as it may occasion a short circuit and cause a burn-out.

The reason for using the R  se crucible, the small end out, is that it has a greater tendency for an accumulative heat, the radiation being largely confined within. With such a furnace I have experienced no difficulty in fusing down steel and also saggar cones, said to have a heat-resisting capacity of 3200  , which is a temperature not surpassed by any furnace made by any manufacturer, and the outside cost of the furnace, as above described, being not more than five dollars.

When good fire-clay is not obtainable and there is danger of fusion, the wires of the muffle may be wound outside of the R  se crucible, though in this case more time is required to heat the furnace up. Instead of making slits in the crucible edge, one may bore a hole through the crucible with a diamond disk, making a ring of holes near the upper and another ring near the lower edge, and through these holes the wire may be threaded back and forth. The crucible should be filled with modeling compound, and held under water while being drilled. I prefer slitting the crucible, for in the event of a burn-out it is more easily repaired.

TO MAKE A CROWN-AND-BRIDGE FURNACE.

To make a bridge furnace, take first a block of paraffin wax $3\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$ inches, or any size that is desired, proportional to this. On each side arrange throughout the length, and a quarter of an inch from each edge, a thin rope of paraffin about one-eighth of an inch thick, sticking the rope to the block. These ropes can readily be made by heating a small lump of paraffin and rolling between two glass slabs. In the end, and near the edge of the block which is intended for the muffle opening, insert a portion of a wooden toothpick. Coil the wire around this once or twice, leaving an end about six inches long; wrap the wire spirally around the paraffin block, No. 28 gauge in this instance also

being used. The coils should be about one-sixteenth of an inch apart, the paraffin ropes holding the wires firmly in place, and yet keeping them away from the block. When the block is covered to the other end the latter is covered by winding the wire around a number of wooden pegs made from toothpicks, the latter being placed on the upper and lower borders about one-eighth of an inch apart, a paraffin rope having also been placed on the end to keep the platinum from touching the block. The last peg reached should be imbedded in the paraffin, as it will be necessary to kink the wire on this to keep it from slipping. An end of wire should be left about six inches long. With an excavator carefully lift up any wires which may be imbedded on the block, except on the corners, so that the fire-clay will run under them and firmly hold them when the block is removed.

Select a pasteboard box, of dimensions proportional to the paraffin block, but enough larger so that when the block is placed within it, and the end centered, there will be a uniform space about three-sixteenths of an inch between the sides of the box and the sides of the block. On each side of the block insert several wooden pegs, permitting them to extend just three-sixteenths of an inch from the surfaces of the block, so that when placed within the box it will be perfectly centered and a uniform thickness of muffle insured. Oil the sides of the box and fill with a soft mud of a highly refractory, but plastic, fire-clay. Having first worked some of the mud carefully over the block and among the wires, slowly settle the paraffin into the box, arranging the mud that squeezes up from the sides carefully over the top of the block, so that there will be a layer thick enough to form the top of the muffle, and carefully place on the lid, squeezing out any excess. Since the muffle must have an opening, there should be no pegs placed in one end of the block, it being permitted to press up tight against the pasteboard.

Permit the box and contents to dry, either over the water-bath or in the sun.

The pasteboard can be easily removed, since it has been oiled, and when the clay is dry enough to permit handling the paraffin is melted out with a hot instrument, a hole being melted out in the center of the block, so that in heating the paraffin with the current the expansion will be toward the center, not toward the periphery.

Next place on a pasteboard box, through the lid of which a hole has been cut, and through which the paraffin may drop during the further melting of it. Stand the muffle on the box over the opening, the door end down, and having connected the rheostat, turn the current to the first notch, immediately breaking it, and again connecting it, alternately, the reason of this being to melt the paraffin on the periphery, permitting it to drop through the hole in the box. Were the muffle to be heated too suddenly, the paraffin would expand and cause a distortion, whereas by heating it gradually, the outside portions are fused and the block finally slips out per force of gravity. The current is slowly connected and broken alternately until the fire-clay is baked hard, but it is not permitted to bake rapidly, lest portions of it fly off from the steam produced. When thoroughly dry the current may

be run up to incipient redness, after which the muffle is ready for investment. Proceed, as in making the inlay furnace, to invest it in bone-ash in some suitable receptacle, such as one of the cylindrical graphite crucibles used by the assayer, or any ordinary white china bowl. Any exposed wires in the muffle may be covered by smearing them with fire mortar.

I have used nearly every electric furnace made by the different manufacturers, and can vouch that the furnaces above described, if made with care, are in every way as efficient as the best.

These furnaces must of course be used in connection with a suitable current controller. The maximum temperature obtainable, when the greatest resistance of the controller is thrown in, should be determined, the maximum resistance of the controller of course being when the lever is at the first notch. The current should be gradually increased until a temperature is reached capable of fusing the porcelain body which the operator intends using. The division on the controller at which this temperature is secured should be marked, and thereafter it is well for the life of the furnace not to pass this point,—though, as stated, much higher temperatures may be readily attained when desired.

MECHANICAL SECTION GRINDER FOR THE PREPARATION OF MICROSCOPICAL SECTIONS.

By **FREDERICK W. ALLEN, D.D.S., Philadelphia, Pa.,**

DEMONSTRATOR OF OPERATIVE TECHNIQS, DEPARTMENT OF DENTISTRY, UNIVERSITY OF PENNSYLVANIA.

(Read before the Pennsylvania State Dental Society, at its annual meeting at Bedford, Pa., July 9, 1902.)

FEW, if any, specimens for scientific investigation are more difficult of preparation than fine ground sections of teeth and bone.

The method of decalcification of hard tissues and imbedding in paraffin and by the microtome cutting thin sections does not produce a satisfactory specimen for scientific investigation, in that the natural characteristics of the specimen are lost by the action of the acids; and the specimen so produced is merely a framework of the original tissue; hence

for scientific value specimens of the hard tissues should be ground from recent materials to the requisite thinness, and the natural conditions preserved.

The method of using grinding wheels in the lathe and finishing the specimen by the laborious method of using oil-stones and rubbing down by hand requires much time, patience, and skill, and is attended with the possibility of breakage or loss of the specimen, for a section ground for microscopical examination is extremely fragile; and by

hand manipulation alone it is almost impossible, unless an exceptional degree of experience and skill has been attained, to get a specimen so prepared parallel or of uniform thickness throughout,—an exceedingly important factor in the correct study of the structure; so that a mechanical appliance of accuracy is required both for rapidity of production and for true surfacing. The machine should also be capable of producing a number of specimens at one time.

In "The Microscope and its Revelations," by Carpenter, pages 424, 425, grinding machines working on the horizontal plane are described, but these machines lack the adjustments necessary for accuracy of measurement and delicacy of manipulation.

The incentive for producing this machine originated through the using of the grinding device made by Mr. S. P. Cowardin, of Richmond, Va., whose work upon hard tissues has been most successful, and his machine, though primitive in construction, in his hands gave excellent results, and his methods of manipulation of the specimens, as set forth in the *Journal of Applied Microscopy*, vol. ii, No. 3, have proved most valuable in the work.

The Cowardin grinding apparatus was acquired by the Dental Department of the University of Pennsylvania, and some experience in its practical use soon developed the fact that it was capable of constructional improvement, with a view to enhancing its efficiency. At the suggestion of Dr. Kirk, a study of the mechanical problem presented was undertaken, and it was because of the need felt for a more precise mechanism, capable of producing results of extreme accuracy, that the instrument which I now have the pleasure of presenting was devised.

THE MACHINE IN DETAIL.

The machine here presented for your inspection is one which will produce sections of the desired thinness in a few minutes, and is capable of producing a number at a time; the specimens will be parallel as to their opposite surfaces, of uniform thickness, and finely polished;

they can be made of any thickness desired from $\frac{3}{4}$ of an inch down to 1-2000 of an inch. The production of fine specimens by this device does not require difficult manipulation on the part of the operator, nor any great degree of skill.

The machine briefly described consists of a circular cast iron base, *a*, supporting a vertical shaft, *b*; securely fastened to the shaft immediately above the base is a cast iron housing, *c*, which holds the phosphor-bronze journal, *d*, and frame for the belt idlers, *e*; above is a guide collar, *f*, on a reduced section of the shaft; in the arm of this guide collar is a guide-pin to regulate the lateral movement of the machine.

Resting upon this collar is the movable housing, *g*, having a long bearing on the shaft. On one side of the housing is a lug to support the brass water-tank, *h*, having a tap and hose connections to the outside of the opposite arm, which conducts the flow of water to the grinding disks. The tank acts as a counterpoise to the weight of the opposite arm.

The extremity of this arm contains a long, accurate bearing, *i*, the upper end being threaded. Screwing on this thread is a large micrometer spill or thimble, *j*, knurled on its upper half to facilitate its moving; its lower half is so graduated that a measurement of 1-2000 of an inch may be easily and accurately read.

Passing through the micrometer and resting upon it, and through the long bearing, is a cast iron girder shaft, *m*, lapped to fit and having a shoulder on its upper end, which rests upon the micrometer.

The lower end of this grinder shaft is recessed to receive the supporting disks, *n*, for the specimens. These disks are threaded and held in position by a bolt, *o*, running through the shaft and having a bronze milled nut on its outer end, the opposite end of which is threaded to receive the disk. By screwing up this bolt the disks are held accurately against the lower edge of the grinder shaft.

FIG. 1.

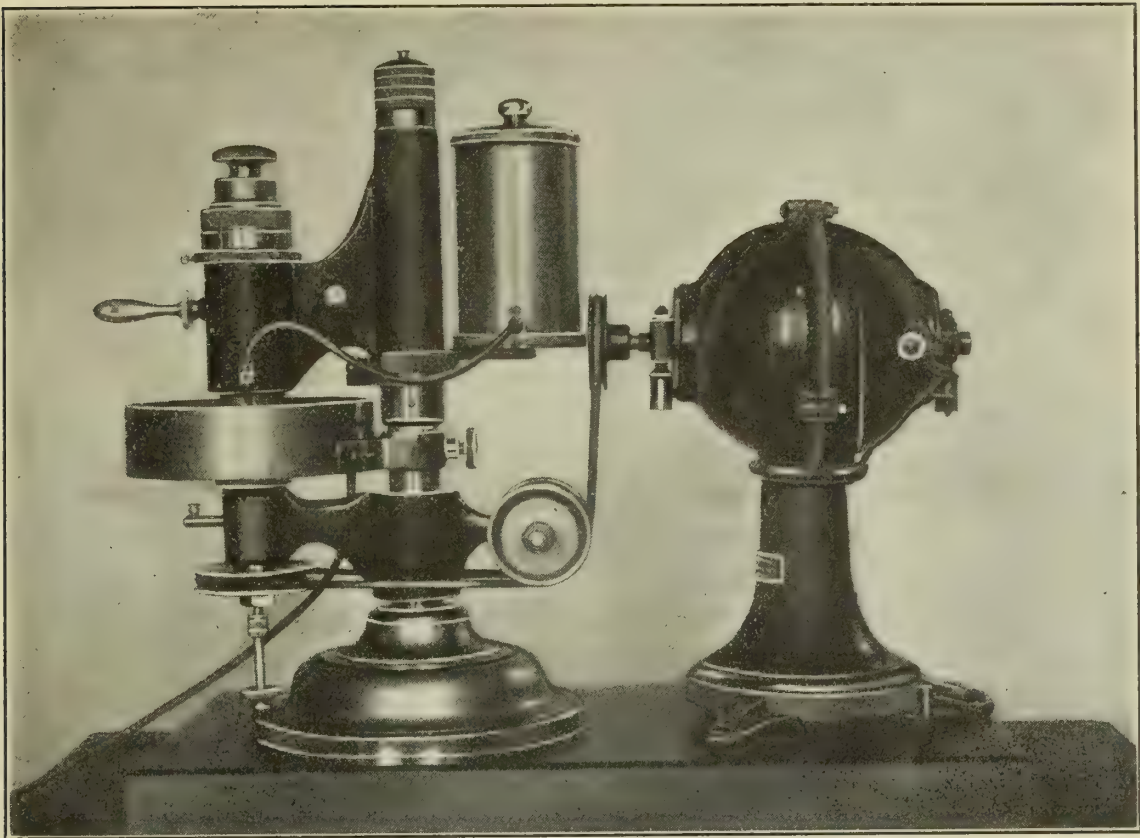
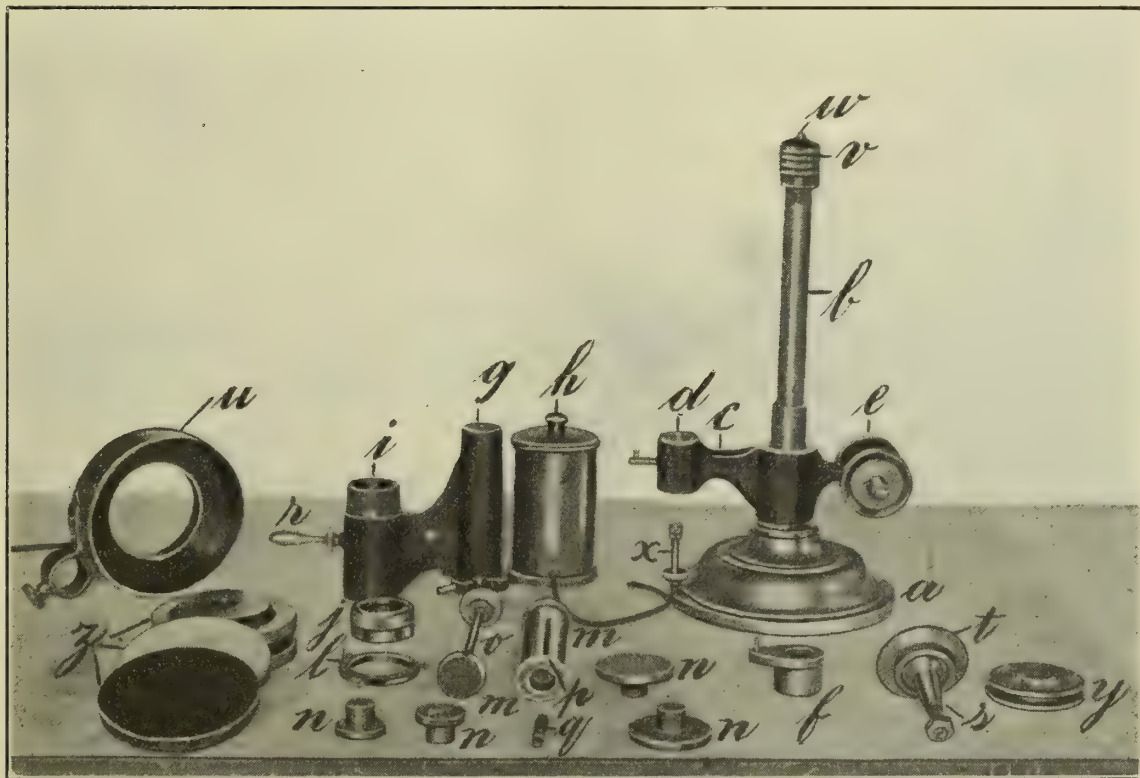


FIG. 2.



a, Circular cast-iron base. *b*, Vertical shaft. *c*, Lower housing. *d*, Phosphor bronze journal. *e*, Belt idlers. *f*, Guide collar and pin. *g*, Movable housing. *h*, Brass water-tank. *i*, Grinder shaft bearing. *j*, Micrometer spill or thimble. *l*, Micrometer index (movable). *m*, Grinder shaft. *n*, Supporting disks. *o*, Grinder shaft bolt. *p*, Spline in grinder shaft. *q*, Adjusting key. *r*, Actuating handle and nut. *s*, Tool steel spindle. *t*, Broad recessed collar. *u*, Drip tank. *v*, Milled cap. *w*, Oil caps. *x*, Compensating screw. *y*, Driving wheel. *z*, Grinding laps.

The grinder shaft is splined or grooved, *p*, from the lower end for half its length. The supporting disks are splined the same depth as the shaft, and when they are adjusted a small key, *q*, is used so that the relation of shaft and disk is never changed, thus preventing any discrepancy in adjustment.

In the center of the arm is a lug, which is tapped to receive the actuating handle, *r*. The end of the handle is reduced to receive the spline or groove in the grinder shaft, thus insuring uniformity in its position. The handle has a knurled nut, to lock it in position. Securing the end of the actuating handle against the bottom of the spline or groove in the grinder shaft locks it at any position desired, and the knurled nut further secures it.

Thus the very lightest grinding can be accomplished with the most fragile specimens.

The spindle, *s*, in the lower housing bearing is of tool steel, accurately ground to fit the double conical bearing. The upper end of the spindle has a broad recessed collar, *t*, and it is threaded to receive the grinding laps. The broadness of the collar insures accuracy in the running of the laps. The lower surface of the collar is recessed to receive the turned end of the housing, thus preventing any grit from working into the bearing.

Surrounding the grinding lap, and connected to the main shaft, is the drip-tank, *u*, having a free fit on the shaft, and having a milled nut for adjustment. The tank has an inner rim, which when the tank is adjusted comes nearly in contact with the under surface of the grinding lap, thus further preventing any grit or water coming in contact with the bearing. By releasing the milled nut, the drip-tank may be lowered so as to clear the laps and to facilitate their removal. The drip-tank is provided with a small hose connection to carry off the water, and the connection projects slightly into the tank, allowing the accumulation of the abrasive materials used, so that they may not be wasted.

On the end of the main shaft is a

large milled cap, *v*, threaded to fit the thread on the end of the shaft; this cap when brought to bear on the upper housing gives greater steadiness to the motion, or it may be brought down solidly upon it, thus locking the arm in position. This cap is provided with a dust-proof oil-cup, *w*, which lubricates the bearing. The spindle is lubricated by an extension arm and a dust-proof oil-cup, *w*, running to the center of the bearing. The idler shaft is lubricated by an oil-cup, which also acts as a set-screw, holding the shaft in position.

In order to relieve the weight of the grinding laps and the action of grinding, a compensating screw, *x*, having a milled nut for adjustment, is placed immediately beneath the spindle, which is provided with a rounded pin, hardened, which, resting upon the compensating screw, takes up the stress.

The driving wheel, *y*, is splined to the bottom of the spindle and secured to the end by a nut. The wheel is grooved sharper than the belting used, thus giving traction without having the increased friction necessary with a tight belt.

The grinding laps, *z*, are cast iron and Scotch stone, the former for rough grinding and the latter for finishing, while for polishing the sections ordinary blotting-pad waxed to the surface of the cast iron laps gives an excellent polish to the specimens.

The abrasive materials used are coarse corundum powders and pumice for rough grinding, and flour of corundum and chalk for fine grinding and polishing.

THE METHOD OF USING THE MACHINE.

Having one surface of the specimen comparatively flat, they are fastened to the supporting disks by means of Canada balsam which has been specially prepared by heating over a water-bath until, tested when cold, it will be indented with pressure but will fracture with a blow.

Heating the supporting disk and coating the surface with the balsam, the specimen is pressed into the softened balsam and the disk is chilled in cold water.

The supporting disk is placed in the grinder shaft by means of the key, and is screwed up securely by the bolt.

The motor started, coarse powder is fed on the lap, moistened by means of water from the tap on the tank, and the specimen is ground until a uniform surface is obtained and the section depth secured, when the entire grinder shaft is lifted out, the specimen cleansed of the coarse powder, and the shaft replaced.

The lap is now charged with fine powder and used until all the scratches made by the coarse powder are removed, when the specimen is again washed, and the lap, faced with blotting paper, is used with the finest whiting, and a brilliant polish is secured.

The machine is fed downward by means of the micrometer screw, allowing the shaft to be lowered to the lap.

After a perfect surface on one side of the specimen is secured, another disk, as No. 2, is heated and given a very thin coating of the balsam, and disk No. 1 is pressed firmly to it, when it is im-

mediately chilled in cold water; by slowly heating disk No. 1 the specimen is released from it and is accurately transferred to disk No. 2; it is then placed in the machine and ground and polished to the desired thinness.

The thinness of a specimen can be determined by knowing the relation of the supporting disks to the laps and setting the index on the micrometer accordingly.

Finished sections are removed by slightly heating the disks and by using xylol. They are then cleansed in alcohol and mounted on slides with the heated balsam, or by the usual method of xylol-balsam.

The small disks allow several sections to be ground at one time, while for a greater number of specimens, or specimens of a large size, disks of four inches in diameter have been provided. This factor is also especially applicable when the specimens are desired for physical tests, as compression, density, etc., though for such tests specimens are comparatively thick, measuring about one-tenth of an inch.

A FEW THOUGHTS.

By **R. H. HOFHEINZ, D.D.S., Rochester, N. Y.**

(Read before the thirty-fourth annual union convention of the Seventh and Eighth District Dental Societies of the State of New York, Buffalo, October 28, 1902.)

IN the course of my experience with porcelain inlays I have met with numerous failures, owing to the rapid dissolution of the cement in mouths in which there was hyperacidity, especially in cases of erosion, where cement is of absolutely no use, and yet where inlays were indicated. In all of these instances the inlays which failed were upon the labial portion of the teeth, the very ones where hyperacid yet prophylactically clean mouths need them.

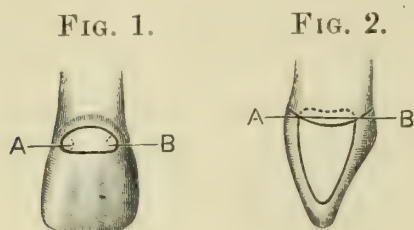
SETTING THE INLAY WITH GUTTA-PERCHA.

In a few cases I overcame the difficulty by deepening the cavity, as sug-

gested by Dr. Capon, of Toronto. Numerous instances, however, demanded a quick replacement of the inlay. To overcome this difficulty I have endeavored to make use of gutta-percha in solution to fill, as far as possible, the small, say 1-1000 of an inch space, between the inlay and enamel margin. My method is the following, assuming cavity to be a labial one:

After the inlay is made the inside is roughened in the usual way. The inlay is then coated with a light-colored varnish and laid aside for the evaporation of the ether. The cavity in the tooth is deepened and slightly undercut at A and B, Fig. 1. The undercuts are filled with

cement. The inlay is carefully held with a pair of tweezers, and the edges are moistened with gutta-percha dissolved in about 90 per cent. chloroform and 10 per cent. eucalyptus oil. (My experience with gutta-percha dissolved in



chloroform alone has been that the chloroform evaporates too fast for its proper manipulation.) The inlay is then gently put in its place. Much care must be given the amount of cement used in the cavity. If there is too much surplus, the cement may dislodge the small amount of intervening gutta-percha. Much neatness is required to get the materials where they are wanted and as needed for their respective functions.

Where I have a large approximal inlay in an anterior tooth, I use the gutta-percha under the gum line from A to B, Fig. 2.

The rest of the cavity, after its proper enlargement, is entirely filled with cement.

I have not used this method long enough to recommend it as absolutely successful, but I have reason to believe that there is enough intrinsic value in the experiment to commend it to the profession for the all but hopeless cases such as have compelled me to apply it.

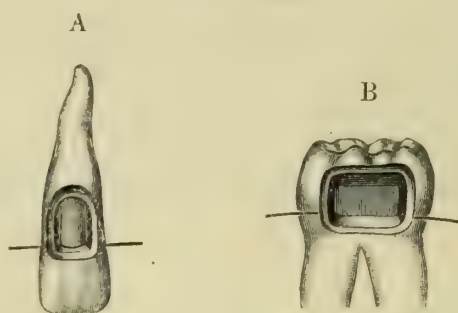
GOLD-AND-GUTTA-PERCHA INLAY.

II. Where I have extraordinarily large labial cavities, especially in canines or unusually large inaccessible buccal cavities in molars, where the pulp might become endangered by the presence of zinc oxyphosphate, I have been in the habit of making an inlay of gold entirely dependent on gutta-percha for its retention. I thought I was original in this method, but in looking over the Transactions of the Odontological Society of 1878, I find an article by Dr. J. Edward Line, of Rochester, in which he says:

"The device consists of a thin plate of platina to the under side of which is attached a wire hook, from the inside of which project two or more curved lugs punched from the body of the plate. I find these caps useful in simple crown cavities in temporary molars, and in compound cavities that involve more or less of the grinding surface; also useful in permanent molars, particularly where the dentist wishes to favor the formation of new dentin."

He used gutta-percha to fill the cavity, and with a hot instrument pressed them into the mass. Dr. Line (or Dr. Quinby, who antedated him about a year, as Dr. Line tells me) would to-day use cement in most of the cases quoted in connection with these inlays. My method of making them differs from that suggested

FIG. 3.



by Dr. Line. I take no impression of the cavity. After preparing the cavity I make a large and distinct bevel around its margin. (Fig. 3.) I then fit a piece of gold, about 28 gauge, against the cavity, being careful that it thoroughly covers the bevel. I increase the depth

FIG. 4.

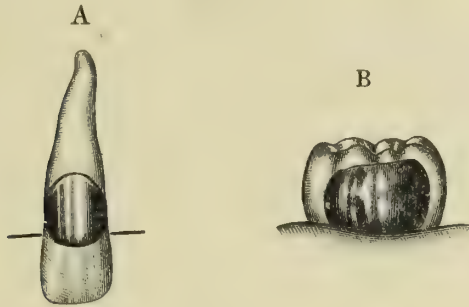


of the cavity, wherever least dangerous to the pulp, and solder small pins taken from porcelain teeth in a direction to correspond to the deepening of the cavity. (Fig. 4.)

The inlay is then polished and made somewhat thinner toward the edge, and is now ready for its position. The cavity

is varnished and filled with a medium heat gutta-percha and the inlay put in place. A small amount of gutta-percha may prevent the inlay from perfectly fitting against the surface of the tooth, and it is for this emergency that I make a good-sized bevel and have the edge of

FIG. 5.



the inlay very thin. The gutta-percha can easily be cut out with a fine and warm excavator, and the inlay so thoroughly burnished against the tooth as to make it doubtful on casual inspection whether it is an inlay or a filling. (Fig. 5.)

A NEW OBTUNDENT.

III. I wish to recommend to the profession, for the treatment of hypersensitive dentin, the use of zinc chlorid in an alcoholic and chloroform solution instead of an aqueous one. I need not dwell on zinc chlorid as an obtunder. The pain is greatly lessened by the chloroform solution, and it acts more rapidly owing to the desiccating and obtunding effect of the chloroform.

TWO PYORRHEA CASES.

IV. I also desire to present two casts for the purpose of illustrating some of the doubts as to the etiology of pyorrhea alveolaris.

Case 1 shows the teeth of a man fifty-five years of age, who keeps his mouth in a thoroughly hygienic condition. I had him under treatment for some time and had his teeth cleaned once or twice a year. Thanks to the excellent result of Dr. D. D. Smith's

work, I see him now every two months. Some three years ago the upper left first bicuspid showed symptoms of pyorrhea, which, in spite of all the care I could bestow, have developed into a typical and serious condition of that insidious malady. No other teeth show a trace of pyorrhea, but a natural recession of the gums such as one would expect at that time of life, nothing more. No systemic troubles, general health most excellent, and the occlusion of the teeth faultless.

Case 2 shows the other extreme. A gentleman of fifty-two came to me about one and one-half years ago with all of his teeth "ready to be sacrificed on the altar of the disease with the unpronounceable name," as he expressed it. I have saved all of his teeth but the upper right lateral, which I extracted and replanted without getting any physiological attachment whatever. The tooth came out, after the splint was removed, four months after the operation. In spite of all my care, prophylaxis remained a book with seven seals to the patient, and the condition could be bettered but very temporarily.

The gentleman spent five weeks in Carlsbad, and returned with his teeth as tight in their sockets as could possibly have been expected of teeth where the absorption of the gum tissue had taken place to that degree. His gums were pink; his general appearance that of a man who had gone through Holbein's fountain of life. A case of typical pyorrhea, decided malocclusion, questionable prophylaxis, and yet five weeks of Carlsbad did more for him than I could have done in any length of time.

The first case, dependent upon neither local nor apparent systemic trouble, has naturally baffled me the most. The second case is one of easy comprehension, and, thanks to the waters of Carlsbad, found its betterment.

It seems as if the many opinions regarding the etiology of pyorrhea might soon form a trust and pay a legitimate dividend.

SOME PROFESSIONAL AND COMMERCIAL THOUGHTS RELATIVE TO ARTIFICIAL TEETH.

By V. WALTER GILBERT, D.D.S., Philadelphia, Pa.

FREQUENTLY we read papers and listen to discussions upon the subject of "artistic dental prosthesis." The general trend of the essayists has been to deplore the state of the art and to plead for more attention and the exercise of more skill in the making of artificial dentures. It is impossible to deny the fact that improvement can be made in this branch of dentistry, but with all the effort made to bring about such improvement we continue to observe the youthful "picket-fence" denture in the mouths of the refined as well as in the mouths of the populace. There must be some good reason for this condition, and I take it that a consideration of the laws of supply and demand in this connection will aid us in determining that reason.

Supplying artificial dentures to the public is in certain respects much the same as supplying it with any other needed commodity. Some people will demand a denture made from the best materials put together with the greatest artistic skill they can employ, others want good materials put together with reasonable skill, and still others will demand cheap material without artistic skill. The weight of the purse often has a great deal to do with the character of the demand; under which conditions the demand for quality grows less as the purse grows lighter.

THE ARTISTIC ELEMENT.

Art in any trade or profession cannot exist unless there be some material encouragement for its support. We find few dentists practicing solely for the benefit of the art, but we find many practicing for the benefit of the private bank account. There are men in the profession who cater to the wants of artistic patrons, and it pays them to do it simply because they have labored and established a reputation for first-class work. The cheapening of the

cost of an artificial denture does not necessarily involve a corresponding debasement of its artistic excellence, for there is ample room for the production of artistic results even in the use of inexpensive materials. The ignorance of the patient in those matters should therefore offer no excuse for the lack of artistic work upon the part of the dentist. The education of the public to a sense of appreciation for dental services must be brought about by the dental practitioner. In every community will be found people to appreciate good, bad, and indifferent work. At the present time indifferent results are accepted by the majority of people requiring artificial dentures because the majority of dentists are making use of indifferent methods in their prosthetic work.

The opportunity to create a demand for practical, artistic dentures was never better than at the present time. The world in general is clamoring for the best that the world can supply, and the demand for high-class dental work is no exception. Some of our old teachers and those in the high places may object to the comparison of trade methods with professional services, but, objection or no objection, the same principle is involved in both cases, and if our patrons are to appreciate the difference between good and bad services we must explain and show that difference.

Ignorance among our patients regarding the character of work required is painfully apparent, and it should be our duty to explain and demonstrate the importance of securing honest, intelligent service. The average person is gifted with intelligence, and when the importance of having an artificial denture intelligently and skillfully made is explained to him, his judgment can be appealed to. Placarding the walls and fences with the fact or rather the lie that a satisfactory denture can be made for \$2.98, is not an essential for finan-

cial success in the practice of prosthodontia. Placard advertising will always appeal to certain classes of people; the fact that such methods succeed clearly demonstrates that ignorance prevails, and incidentally shows a fertile field in which dental education would prove productive of much good.

Artistic prosthesis has appealed to the few, and will continue to appeal to the few just as long as this branch is neglected by the practitioner; there will never be a demand for skilled services until the demand is created by the practitioner himself.

THE COMMERCIAL FACTOR.

Catering to the public is an art which has at all times engaged the attention of commercial men. Commercial minds in the dental profession recognize an excellent field for the display of their talents in the practice of dentistry, and so we find these commercially inclined dentists serving all sorts and conditions of patrons. The question of "supply and demand" is the vital point upon which depends the production of anything which is offered for sale. It matters not whether we refer to professional services or to trade products, the demand in each case will influence the supply. Every city and town has its first, second, and third-class professional and commercial citizens, and the second or medium class will be in the majority, because the majority of the population will belong to the medium class of people.

The money-spending people of our population belong to the great middle class, and it is with this class that the average professional or business man conducts his calling. The observant man will certainly acknowledge that the average dentist does not cater to the *élite* or artistic members of society.

What does the public know about the "temperamental characteristics of teeth in relation to dental prosthesis"? What does it know about the importance of ridge-lap, bite, and occlusion? and how many dental practitioners take the time or trouble to explain these things to their

patients? If Mrs. A wants a pearly set of teeth just like Mrs. B, she can have them. What difference does it make to the money-maker that Mrs. A is a large, blonde lady while Mrs. B is a diminutive brunette?

The code of ethics, unfortunately, appeals to many practitioners only when a competence has been secured; the average man looks upon the code as a theory and upon his relation to the public as a condition, and so we find the great mass of dentists taking a practical view of conditions and giving the public what the public thinks it wants, irrespective of what it ought to have.

The following will serve to illustrate the average dentist's opinion of practicing artistic prosthesis: Two young men matriculated in a dental college. One was conscientious and devoted much of his time to the artistic side of his calling; the other was not so conscientious and paid more attention to the human side of it. These young men left the college, as might be expected, one at the head of his class the other near the foot. They settled in the same city, the "human nature" man making an immediate success, the artistic man scarcely making a livelihood. Meeting on Broadway one day the following conversation took place: "How is it, Joe, that you who know so little about the artistic side of dentistry and are not over-conscientious have succeeded in establishing a paying practice, while I who am competent and conscientious can scarcely make things go"? "I can answer you in a minute or two, Tom. Just scan the faces of the first hundred people who pass us, and when the one-hundredth has passed let me know." "Well! out of that hundred people how many do you really think would appreciate first-class artistic treatment?" "I should say about ten." "That's too many, but we'll let it go. You are serving the ten, and I'm after the ninety."

In view of the state of affairs which this conversation clearly represents, let us see how it affects the manufacture and the demand for artificial teeth. It is frequently the subject of complaint by es-

sayists and speakers who deal with this topic that the manufacturers are to blame for supplying teeth so poorly conceived and executed as to be impossible of artistic treatment by the dentist.

THE STANDPOINT OF THE MANUFACTURER.

It is well to start out with the understanding that the manufacturers of artificial teeth are commercial men; they are in business to supply teeth which will give the greatest satisfaction to the greatest number. They must make teeth which sell in quantities, and the particular forms which have the greatest sale are looked upon as the best of their production.

As far as supplying teeth is concerned, the manufacturer is just as willing to make "natural looking" specimens as he is to make "porcelain beans." What beneficial results can possibly accrue to a manufacturer who endeavors to force upon his customers something which they do not want? Commercial men are too shrewd to pursue any such policy; the necessities of the case require them to work upon an opposite plan and to endeavor to produce what they know their customers want. The manufacturer's indication of what is wanted is shown by his record of sales. If an ill-shaped, deformed, ugly-looking tooth sells better than an ideal, perfect, and beautiful-looking tooth, is it not common sense to presume that the former is the popular product?

Let us first examine and then analyze some of the specific complaints which we hear relative to the manufacturer's product:

"Why do the manufacturers give us teeth which are perfectly formed, each tooth in a set being symmetrical in form with its mate?"

"Why is it that the mass of dentists use bicuspid and molars that are out of all proportion to the fronts in a majority of sets?"

"Why are we compelled to take such poor combinations of upper and lower teeth?"

"Teeth found in the mouth are not

uniform in shape; why, then, should the manufacturer compel us to accept sets of teeth all of one color?"

"Back teeth of the natural denture are much darker than the front teeth, but in our artificial substitutes the shade is just the same."

"Makers should be made to see to it that a fair proportion of plain plate teeth should have the pins placed lengthwise."

Taking up the complaints as they have been stated, let us analyze each of them not only from the professional side of the dentist, but from the commercial side of the manufacturer.

THE QUESTION OF FORM AND ARRANGEMENT.

First. "Why do the manufacturers give us teeth which are perfectly formed, each tooth in a set being symmetrical with its mate?"

Like the Yankee, let us answer this question by asking another: Is there any sound professional reason for wishing the manufacturers to mismate artificial teeth? I think not. It is true that nature never used a micrometer gauge in making the human teeth. It is true that the left central is seldom exactly like the right central; there is always a difference in the form of laterals, and so on,—each tooth in the denture has its individuality. The ravages of nature have their effect upon the individual tooth. Mastication, lack of occlusion, disease, etc., each does its part in wearing and shaping the teeth until there is little more than type existing between pairs of teeth which were at one time closely mated in form. At the time in life when artificial teeth become a necessity, the natural organs would have been mutilated to such an extent that symmetry is destroyed. Admitting all this, nevertheless it is maintained that the artificial set which is to act as a substitute should not be mismated by the manufacturer. It is as unreasonable as it is undesirable to expect any manufacturer to make teeth which would be in accordance with the innumerable stages of wear and discolorations found in the human mouth. Individual cases

must always require individual effort; modifications of artificial teeth must be made to suit the particular case in hand. It is desirable that artificial teeth continue to be supplied in their present form. If a dentist can purchase a perfect tooth of a type desired, it is possible for him to age and mutilate, with dental appliances, that artificial tooth just as effectively as nature with her methods ages and mutilates the natural organs. The question of artistic teeth for individual cases is a matter entirely removed from the dental supply house.

The commercial reply to the first question is a good and a short one: "Mismated sets will not sell."

Second. "Why is it that the mass of dentists use bicuspid and molars that are out of all proportion to the fronts in a majority of sets?"

This question can only be answered by the individual dentist, but in general we should presume that they do not consider the bicuspid and molars "out of all proportion," but are satisfied with the combinations which the manufacturer provides. If the question is meant to imply that dentists are obliged to use the combinations of posterior with anterior teeth as now supplied by tooth-manufacturers, then there is no basis of fact to verify the statement. In order to standardize their product, manufacturers of artificial teeth must necessarily have some rule for combining the "backs" with the "fronts," and these combinations are made according to the best judgment of practical men who have such work in charge. The men who are responsible for the manufacturer's combinations of posterior with anterior teeth never expected that their ideas would meet with the approval of every dentist. Their idea was to make combinations which would meet with the approval of the greatest number. The fact that the mass of dentists persist in using the sets clearly demonstrates that the judgment of such men was good. If the bicuspid and molars are, in the judgment of an individual, "out of all proportion to the front sets," is there any law or any objection to prevent that individual from

going to a supply house, making his own selection of anterior teeth from "sets of six," his posterior teeth from "sets of eight," and combining the two selections to make his upper or lower set of fourteen?

It is possible for any dentist to make his own combinations if he does not like the combinations made for him.

Third. The next question, "Why are we compelled to take such poor combinations of upper and lower teeth?" is similar in nature to question number two. We are not compelled to take the combinations of upper and lower teeth which the manufacturers supply. It is within the province of the individual to make his own sets from selections as before stated.

THE QUESTION OF COLOR.

Fourth. "Teeth found in the mouth are not uniform in color; why, then, should the manufacturer compel us to accept sets of teeth all of one color?"

Of course the teeth found in the human mouth are not uniform in shade any more than they are uniform in shape. Observant dentists discovered many years ago that there was a decided difference in shade existing between the different teeth in a denture, and for years past some artistic men have been making artificial dentures in which the shades of the porcelain teeth have been varied. The writer can well remember seeing Dr. W. G. A. Bonwill sitting at a tooth-counter picking out individual shades and forms of teeth to make his partial or complete sets. Dr. Bonwill recognized the fact that uniformity in shade was objectionable; he said that each case required him to make an individual selection, and he spent many an hour selecting "odd" teeth.

Dr. E. A. Royce some time ago read a paper before the Chicago Dental Society in which he called attention to the variation in shade existing between individual teeth in the same denture. Dr. Royce made the first effort to standardize this variation by making the upper central incisors the basal or zero unit of his scale, and numbering the other teeth ac-

cording to their divergence from his unit.

An examination of the table prepared by Dr. Royce is instructive and will prove of assistance to the artistic dentist when making a selection of porcelain teeth for a denture. All such observations of natural conditions are essential to the dentist who expects to disguise his artificial restorations, and should clearly demonstrate to the prosthodontist that he should make his own selections of individual teeth.

It is rather difficult for the writer to understand how a dentist who really wants to make an artistic piece of work can expect to find in the stock of a manufacturer a set of teeth entirely suited for a case in hand. Since we recognize the fact that the individual teeth composing a denture are of various forms and shades, we should observe still further that such variations are not uniform in the natural dentures of any two individuals. If manufacturers were to attempt to mismatch shades in their artificial sets, such matchings would not meet with the approval of artistic patrons and the mass of dentists would not think of purchasing such sets. Is it not possible under present methods for any practitioner to make sets of teeth according to his own ideas? Artificial teeth can be purchased as odd teeth, in pairs, sets of fours, sixes, eights, sixteens, fourteens, or twenty-eights. With the privilege of making purchases as he desires them, what is there to prevent a dentist from making his dentures from single odd teeth? It certainly seems that the manufacturer has taken all things into consideration and given the profession every chance to make use of its artistic talents of selection.

ARRANGEMENT OF THE PINS.

Fifth. We come to the last question or rather statement in the list: "Makers should be made to see to it that a fair proportion of plain plate teeth should have the pins placed lengthwise."

The best way for the profession to have the "makers see to it" is for the profession to make the demand for plain

plate teeth "having the pins set lengthwise." For the purpose of determining whether there is any justice in the above statement, the catalogue of a leading manufacturer was consulted, and it was determined that out of 195 forms of plain plate teeth, 138 of these forms could be secured having the "pins set lengthwise." The question of supply and demand is plainly demonstrated in this instance, and shows that "cross pin" teeth are in evidence in the manufacturer's stock simply because the demand is for "cross pin" teeth.

A MATTER OF EDUCATION.

The development of "artistic prosthesis" is in the hands of the dental profession, and its advancement is largely dependent upon the ability of the profession to educate its patrons up to an appreciation of its requirements. If the dental profession does not demand what a few idealists think it should demand, the reason lies with the profession. Make it sufficiently conclusive to commercial men that there is a paying demand for anatomical artificial teeth and the teeth will soon be in evidence.

The plea for more attention and the exercise of more skill in the construction of dentures has been made by able men, yet few have responded to the call. The reason is undoubtedly due to the commercial conditions in dental practice which have been cited. It is believed, however, that a course of procedure can be definitely outlined which will enable the artistic dentist to create a demand for his services. Without touching upon the important factors of adaptation, articulation, and enunciation, the suggestions will be confined to selection and arrangement of the teeth.

Before attempting to specialize in this branch of dentistry, the practitioner should make himself familiar with the various temperaments and the physical characteristics which distinguish one temperament from another. Carefully prepared charts on temperament have been devised by observant men and published in the "American Text-book of Prosthetic Dentistry." These tempera-

ment charts have classified not only the physical characteristics which denote the temperament of an individual, but have also classified and described the shape, color, texture, arrangement, and articulation of the teeth which a given temperament requires. By making use of a temperament chart, the artistic dentist can begin the construction of a denture by carefully studying the physical characteristics of the patient, deciding upon the temperament and consulting the chart to ascertain the character of artificial teeth required.

For example: A patient who would answer description No. 12 (nervolymphatic) would require teeth according to description No. 12 (nervolymphatic). Having such a guide to aid in the selection is invaluable and assists greatly in establishing a base upon which to work out the individual requirements for a case in hand. While the temperament chart is a valuable aid to the beginner in this class of work, a close study of each subject is recommended so that the practitioner can depend upon his own judgment and ability to recognize the elements which will enable him to attain harmonious results. In addition to becoming familiar with the various temperaments and their requirements the dentist should make himself familiar with the product of the manufacturer. The catalogues and stock of the leading manufacturers have been intelligently and systematically arranged in such a manner as to facilitate intelligent and quick selection. Much time and energy which are now wasted can be conserved at the counter and in the

laboratory if the subject of selection be properly studied.

SOME SUGGESTIONS.

After the artificial teeth have been selected and "set up" in wax, every case should be tried in the mouth. An effort should be made to have the patient laugh, smile, show anger, sorrow, etc., so that if need be an individual tooth can be twisted, ground, or lengthened to harmonize with the facial features.

One of the greatest obstacles encountered by the dentist who desires to practice artistic prosthesis is the lack of appreciation of artistic conditions on the part of a patient. The patient should not be permitted to exercise a wrong influence in the arrangement, color, or form of the teeth during this process of the work. A difference is generally found to exist in the minds of patients regarding artistic arrangement. In many cases this difference exists to such an extent that the dentist feels obliged to make a change which he feels to be wrong. Patients are seldom qualified to pass judgment upon the character or the arrangement of artificial teeth, notwithstanding the fact that they think themselves eminently qualified. Women are especially inclined to insist upon having dentures in which the teeth are light in shade, regular in form and alignment,—and there are things easier to accomplish than convincing a woman against her will. The ability of a dentist to demonstrate his talent and appeal to the judgment of the patient marks the difference between the purely mechanical and the artistic practitioner.

A DENTAL BOOK OF THE SIXTEENTH CENTURY.

By JULIO ENDELMAN, D.D.S., Philadelphia, Pa.

FROM the early history of dentistry little can be learned beyond the fact that efforts were made to relieve acute dental disorders, and while some light has been thrown on the question of ancient dental medicine by the discovery of the Ebers papyrus, we are

as yet almost in the dark regarding the surgical methods employed by the ancient physicians who devoted part of their time to the treatment of diseases of the teeth. In the papyrus of Ebers several prescriptions for the treatment of dental maladies have been discovered,

but no record has been found regarding the instrumentation or surgical procedures of ancient dentists.

The history of dentistry before the Christian era—and, as a matter of fact, for several centuries after—is confined to disconnected facts; and so far as we have been able to ascertain, many important links of this historical chain are yet missing. Historians mention that Æsculapius, who lived thirteen hundred years before the Christian era, was the first to practice the extraction of teeth, but from his time almost nothing can be found until the fourth or fifth century B.C.

The first reference to dental specialists is found in the writings of Herodotus of Halicarnassus (Vincenzo Guerini, *DENTAL COSMOS*, vol. xliii, page 1), but from then until the Renaissance, data bearing on dental medicine or surgery are incomplete or totally missing.

EARLIEST DENTAL LITERATURE.

With the sixteenth century, which was marked by the revival of science and art, which for almost a thousand years had been buried in complete oblivion through the ambition of selfish rulers and religious wars, dentistry began again to be the subject of some attention, and it is this period of its history which is marked by the publication in book form of the first work on the teeth. This little volume, entitled “Zahnarzney,” was published at Leipzig in 1530, successive editions of this work having been published at “Meynz” in 1532 and at Frankfurt in 1536 and in 1541.

Twenty-seven years after the first book on dentistry saw the light of day, another work on the teeth was published at Valladolid; and it is this comparatively ancient dissertation that we now desire to review, believing that a description of this booklet, setting forth in a general way its more salient points, may present features of historical interest. The title-page, here reproduced, is an example of the tendency of ancient authors to give to the titles of their works the character of introductory paragraphs.

This ancient specimen of dental litera-

ture gives a very fair idea of the status of dentistry in Spain in the sixteenth century. Within its pages the author presents us with not only the conception held at that time relative to the structure of the teeth and their surroundings, but also impresses the importance of

COLOQVIO BREVE Y
cōpédiofo. Sobre la materia d la dé
tadura, y marauillofa obra d la bo
ca. Cō muchos remedios y au
fos neceffarios. Y la ordē
de curar, y adreçar
los dientes.



¶Dirigido, al muy alto y muy poder
oso señor: el Principe dō Carlos nro se
ñor. Cōpuesto por el Bachiller Frāncisco
Martinez. Natural dela villa de Castrillo
de onielo. Estāte en Valladolid. 1557.
Con preuilegio.
¶Esta tassado en L VII. m^{rs}.

Translation.

“BRIEF AND COMPENDIOUS COLLOQUY on the Structure of the Denture and the Wonderful Construction of the Mouth. With Many Remedies and Necessary Advice. Together with the Mode of Treating and Beautifying the Teeth. Addressed to the most high and powerful sire the Prince Don Carlos our lord. Composed by the Baccalaureate Francisco Martinez, native of the city of Castrillo de Oneilo, Valladolid. 1557. CON PRIVILEGIO. This is valued at LVII. maravedis.”

giving to these organs a reasonable degree of care and attention. He says that “for the preservation of human health and for the prolongation of life, next to natural heat the most important and essential factor is the teeth.” The work, which consists of 152 octavo pages, is dedicated to the Prince Don Carlos, son of Philip II of Spain.

The subject-matter is divided into four parts. In Part I the author deals with the definition of the teeth, and discusses the object for which nature created them. In Part II he treats of the three periods into which he divides the

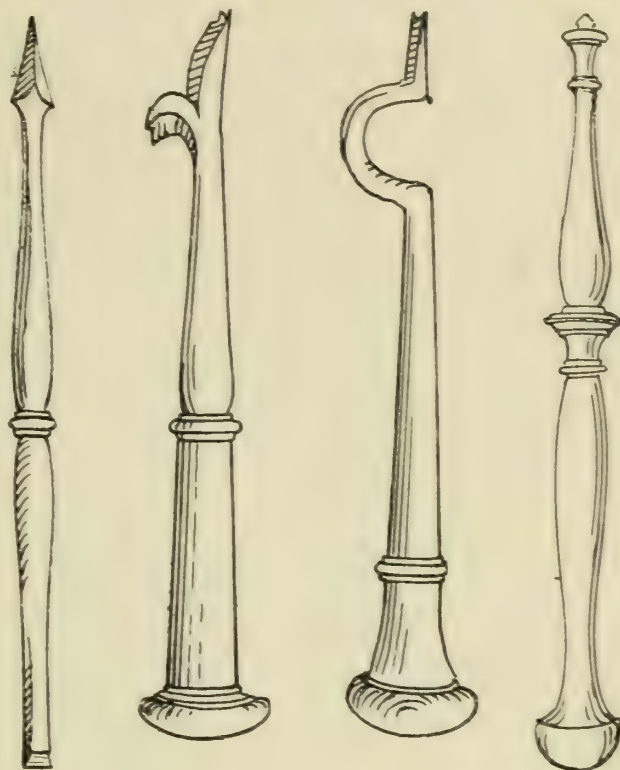
life of the teeth, and also of the treatment of the diseases of which they may be the seat at these respective times. The first period of his classification embraces the time from the eruption of the deciduous teeth to that of their substitution by the permanent organs. The second, from the eruption of the permanent teeth to the time when they have reached their full development; while the third period, beginning when they are presumed to have attained complete development, runs to the time when they fall out from disease or other causes.

CARIES AND EXTRACTION.

We find in the second division that Martinez recommends, in order to prevent decay of the deciduous teeth, that whenever little black spots appear upon their surfaces they should be removed by means of the instrument shown in Fig. 1, and that the spot should then be rubbed vigorously with a stick dipped in boiled wine to which some alum and common salt have been added. In this connection it is interesting to observe that the purpose he has in view in advising that the deciduous teeth should be properly cared for is not for the benefit that the child would derive therefrom, but so that when these teeth had to be extracted, an operation which he considers essential in order that the permanent teeth may erupt properly, extraction might not be rendered troublesome and difficult by the breaking down of the decayed crowns. For the extraction of these teeth he used the elevators shown in Figs. 2 and 3; the instrument shown in Fig. 2 was for the extraction of the front teeth, while for those located in the back part of the mouth the one shown in Fig. 3 was employed. From a therapeutic viewpoint it is interesting to observe that for the arrest of hemorrhage the application of boiled wine was in vogue. He also used Roman vitriol (copper sulfate), directing that the seat of the hemorrhage should be tamponed with gauze pellets charged with it, but the parts should always be previously washed with boiled wine to which small quantities of incense, myrrh, rosemary,

and spikenard should be added. In cases of slight hemorrhage he used Roman vitriol mixed with a small quan-

FIG. 1. FIG. 2. FIG. 3. FIG. 4.



tity of Armenian bole. In other cases, instead of the vitriol he used powdered burned sponge, or powdered and burned hare's hair.

To avoid the extraction of the wrong tooth, when the seat of the disturbance could not be located by external appearances, Martinez employed the instrument shown in Fig. 4 to percuss every tooth, extracting the one in which the painful response was more intense; and when it was necessary to ascertain which one among several decayed teeth was the one causing the pain, he excavated the several cavities with the instrument shown in Fig. 5, the one in which the

FIG. 5.



pain was more accentuated being then sacrificed to the forceps. His reasons for adopting this course are given in the following terms: "If this one feels the instrument more than the others, it is because it is more decayed, and also because the nerve is more exposed than in

the others; but, as sometimes the lesion may be between the teeth, they should be tapped with the instrument for this purpose" (Fig. 4).

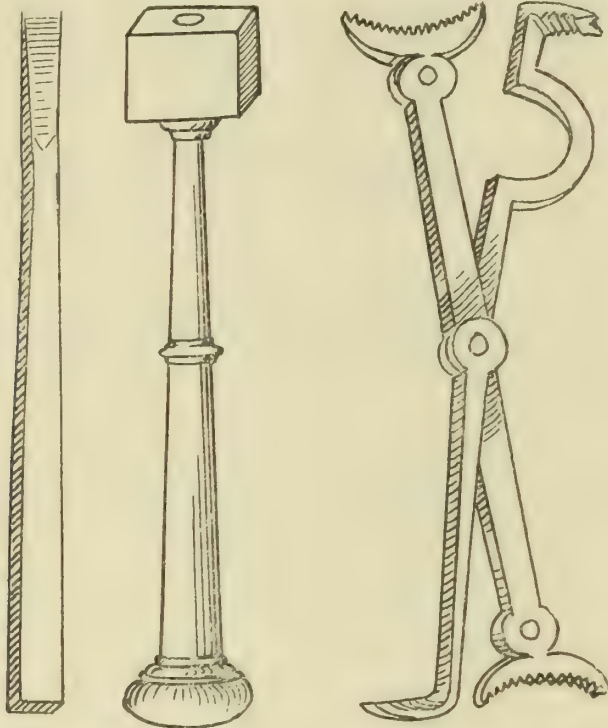
SEPARATION OF THE TEETH.

"Separating the teeth so as to use the pointed instrument may be done, but requires great care, subtleness, and experience. It may be accomplished with a very sharp chisel and mallet, as in this way it is done with more ease and delicacy, and it is less painful than filing, although at times it may become necessary to use the file at first to facilitate the cutting." See Figs. 6 and 7.

FIG. 6.

FIG. 7.

FIG. 8.

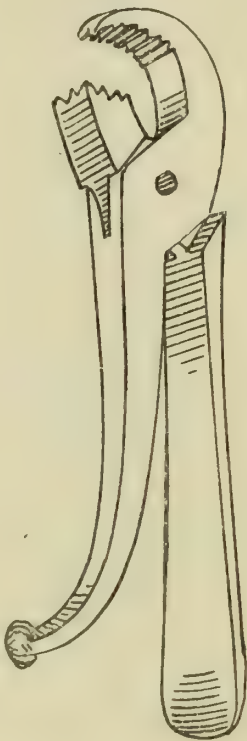


In extracting, when the tooth is decayed only slightly the forceps should be employed, but if there be the least suspicion that the tooth will break under the forceps, the pelican should be used. To extract fragments of roots, he employed the instrument shown in Fig. 8. Figs. 9, 10, and 11 illustrate the style of forceps in vogue in the sixteenth century, and it is both curious and interesting to observe their similarity with some varieties at present in use.

In Part III we find a dissertation on the four diseases which were supposed to affect the teeth during their third period of life. These diseases he classi-

fied as, first, the "Neguijon" (from *nigellus*, black), with which they designated the condition familiar to us at

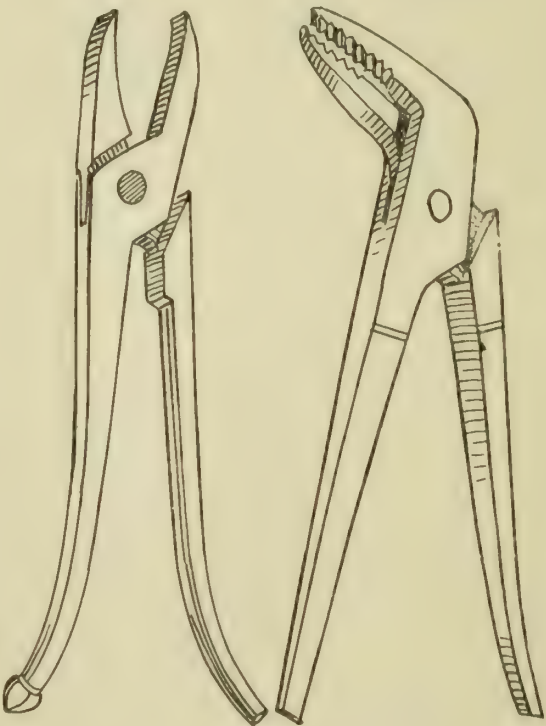
FIG. 9.



present under the name of dental caries; second, "Corruption of the gums"; third, "Tartar," and fourth, "Traumatisms."

FIG. 10.

FIG. 11.



INSTRUMENTATION.

In this chapter we find a description of the author's method of removing de-

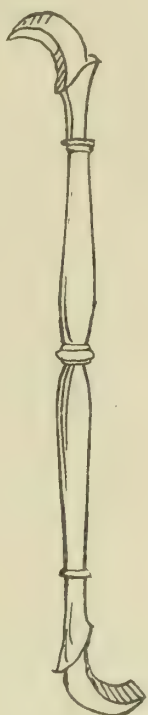
posits from the teeth, for which purpose the instruments shown in Figs. 12, 13, 14, 15, and 16 were used. The instru-

FIG. 12.

FIG. 13.

FIG. 14.

FIG. 15.



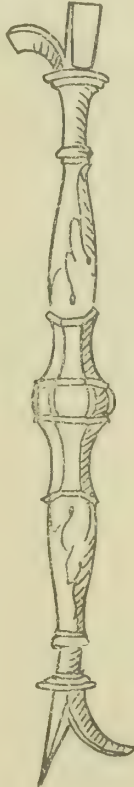
ments illustrated in Figs. 17 and 18 represent a universal toothpick and a file used to sharpen its points, while the one in Fig. 19 was employed for the purpose

FIG. 16.

FIG. 17.

FIG. 18.

FIG. 19.



of removing sharp corners from the molar teeth.

Part IV is devoted to a dissertation on the manner of preserving the denture.

On account of the short space at our disposal, we are unable to include in this review many features of this book which would portray the exact condition of dentistry in the second half of the sixteenth century.

As far as it has been possible to ascertain, there are only two copies of this work in existence. One is the property of Dr. Florestan Aguilar, and is the one from which through his courtesy we have prepared this descriptive notice, and the other is in the library of his majesty King Alfonso XIII at Madrid. This book enjoys the prestige of being one of the first published works on dentistry, in this respect being preceded only by the work already referred to, entitled "Zahnarzney," published in Frankfurt in 1530.

ST. APOLLONIA.

The engraving representing St. Apollonia which is herewith reproduced is taken from the last page of the book. A different likeness of the "patron saint of

Parte.

Fo. 152



Virgo martir egregia
pronobis Apollonia:
Funde preces ad dominū
ne proreatu diminū:
Vexemur morbo dentiū.

dentistry," reproduced from a painting in the altarpiece of the church of Sta. Apollonia in Rome, appeared in the *International Dental Journal*, vol. xxi, page 1, and in the *DENTAL COSMOS*, vol. xlii, page 193. St. Apollonia, who suffered martyrdom after first having her teeth extracted one by one, was canonized in Rome 300 A.D., and since then prayers have been addressed to her by the faithful for the relief of pain of dental origin.

CORRESPONDENCE.

ANTISEPTICS IN LOCAL ANESTHESIA.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In a paper on "Local Anesthesia: its Uses and Abuses," published in the November issue of the *Dental Era*, Dr. F. D. Stolford gives the ingredients of the formula for a local anesthetic which he recommends and which he has been using for the last eighteen months without any apparent bad results. It is stated that the preparation contains cocaine, carbolic acid crystals, glycerin, and distilled water. The author says that the object of the carbolic acid is to render the solution sterile, but does not in any way refer to the injurious effects that are known to follow the injection within healthy tissues of solutions of carbolic acid, even in small proportions.

In order that carbolic acid should preclude the possibility of microbic development it must be added in a proportion that would render the solution unfit for hypodermic purposes, inasmuch as strong phenicated solutions when injected into the substance of healthy tissue are likely to produce disorganization of its cellular elements. The incorporation of antiseptics in solutions of cocaine hydrochlorid is probably due to the prevalent idea that the inflammatory phenomena which in some cases are known to follow the injection of cocaine are caused by the contamination of the solution by micro-organisms. It is probable that this is what occurs in some

cases, but in a large majority it is due to the use of too strong solutions rather than to microbic infection. If used in too strong proportions it produces inflammatory disturbances from which the tissues cannot recover. This is especially the case when strong solutions are injected in tissues already debilitated by the toxic products of an existing inflammatory condition, as in the case of teeth the seat of pericemental inflammation. It is in this class of cases that sloughing after the injection of local anesthetics generally occurs. But if used in the right and safe proportions, viz, 1 to 1½ per cent., no bad results will follow, as has been shown by the statistics of several thousand operations performed by Professor Réclus at the Laënnec Hospital of Paris.

In the writer's opinion the only drugs that should enter into the composition of solutions for local anesthesia should be cocaine, distilled water, and a vaso-dilator like tri-nitroglycerin to counteract the powerful vaso-constrictor action of cocaine; and if all necessary precautions be taken, and a fresh and sterile solution in the proportion already named be injected, it is more than probable that the patient will not experience any objectionable or painful after-effects.

JULIO ENDELMAN, D.D.S.

PHILADELPHIA, Dec. 13, 1902.

WEDELSTAEDT *CONTRA* HOFHEINZ.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I have read with much pleasure and some interest Dr. Wedelstaedt's reply to my paper on "Extension for Prevention."

I am not well enough to reply to the

reply at once, but promise the readers of the *Cosmos* to do so at my very earliest possibility.

R. H. HOFHEINZ.

ROCHESTER, N. Y., Jan. 15, 1902.

PROCEEDINGS OF SOCIETIES.

INTERNATIONAL DENTAL FEDERATION AND INTERNATIONAL COMMISSION OF EDUCATION.

Second General Meeting, held in Stockholm, Sweden, August, 1902.

(Continued from vol. xlv, page 1259.)

EXECUTIVE COUNCIL.

FIRST EXTRA SESSION—AUG. 14, 1902.

THE meeting was called to order at 4 P.M. in the Grand Hotel at Stockholm, by the president of the Executive Council, Dr. Chas. Godon. The following members were present: Drs. Aguilar, Cunningham, Förberg, Harlan, Hesse, and Sauvez.

Dr. Sauvez made an *exposé* of the financial situation of the Federation, and stated that the expenses of the meetings at Paris, London, and Cambridge amounted to 1164.30 francs, and the receipts to 775 francs. He also stated that there were as yet a number of subscriptions to be collected, and that this would balance up the account. He then submitted to the several members of the Council his written report.

The Council then decided to appoint a committee to study the arrangements made last year with the publisher of the transactions of the Federation, and to prepare a contract for the publication of the transactions of the present session. Drs. Harlan and Franck were appointed as such committee.

Dr. Sauvez then stated that the expenses incurred in the preparation of the present session of the Federation amounted to 1295.65 francs, this sum including the cost of preparing and publishing the three fasciculi published by the Federation.

The Council appointed a committee composed of Drs. Aguilar and Sauvez to study the best way of defraying the expenses of the Federation meetings.

SECOND SESSION—AUGUST 15TH.

The meeting was called to order by President Godon at 10.30 A.M. The

minutes of the last meeting were read and approved. Dr. Cunningham presented the regrets of Dr. J. E. Grevers, Amsterdam.

The committee on finance, appointed at the last meeting, presented a report. The committee believed that each member of the Council and of the different commissions should pay a fee of fifty francs, and that the delegates should pay a fee of twenty-five francs. They also advised the opening of a voluntary subscription among the several journals, federations, associations, and societies, and that the committees of organization of future congresses shall also contribute toward this fund. The committee also decided that when a member represents several societies, he should pay a separate fee for each such society. The Council adopted these propositions.

Dr. Florestan Aguilar was then unanimously elected treasurer of the International Dental Federation.

On motion by Dr. A. W. Harlan, Chicago, Dr. Truman W. Brophy was introduced, in order to present the several invitations relating to the Fourth International Dental Congress.

Drs. Förberg and Sauvez then made a few remarks regarding the opening session of the International Dental Federation to be held at the Caroline Institute.

The questions embodied in the invitations presented by Dr. Brophy were then discussed by the members of the Council.

THIRD SESSION—AUGUST 16TH.

At this afternoon session, the president called the meeting to order, and Dr. Sauvez, the secretary-general, read the minutes of the last session, which were approved.

The invitation of the United States to hold the Fourth International Dental

Congress in St. Louis was again taken up for discussion. Dr. Cunningham proposed that the final decision should be taken at the next meeting of the Federation. Drs. Franck and Harlan asked that the final decision should be taken at the meeting of the Executive Council to be held August 18th. The Council accepted this last proposition.

FOURTH SESSION—AUGUST 16TH.

Dr. Chas. Godon, President of the Council, called the meeting to order at 11.30 A.M. The following members were present: Drs. Aguilar, Cunningham, Förberg, Franck, Harlan, Hesse, and Sauvez. The minutes of the last session were read and approved.

Dr. Sauvez read the list of the delegates of governments, federations, and societies. He also read a list of the members at that time in Stockholm. Dr. Sauvez read the names of those that had been proposed as members and adjunct members of the International Commission of Education and of the International Commission of Public Dental Hygiene.

After the Council had rectified these lists, the secretary-general read a letter relative to the appointment of Dr. Klingelhofer as the representative of the government of Russia. Dr. Klingelhofer was then appointed adjunct member of the Executive Council of the International Dental Federation.

FIFTH SESSION—AUGUST 16TH.

Dr. Chas. Godon presided over the session, which was attended only by Drs. Aguilar, Franck, and Sauvez. After having approved the minutes of the previous session, the secretary-general proposed a program for the meeting to be held August 18th. This program as submitted by Dr. Sauvez was approved by the Council, which then adjourned until August 18th.

SIXTH SESSION—AUGUST 18TH.

The meeting was called to order at 12 noon by the president, Dr. Godon. The

meeting was attended by Drs. Aguilar, Cunningham, Förberg, Franck, Harlan, Hesse, and Sauvez. The minutes of the previous meeting were read and approved.

After a short discussion regarding the F. D. I. banquet, the question of the invitation of the National Dental Association of the United States to hold the Fourth International Congress in the city of St. Louis was brought up for discussion.

Dr. Cunningham moved that the reply to this invitation should be postponed until the next meeting of the Federation.

Dr. A. W. Harlan was willing that the decision should be postponed to the next session, in order to give time to examine a technicality in the invitation in question, but Drs. Hesse and Aguilar stated that it was preferable to take up the discussion at once, as the Council must take into consideration that the invitation had been addressed through regular channels and in due form.

Dr. Cunningham insisted that the final decision should be deferred until the next session of the International Dental Federation, thinking that perhaps by that time invitations from other countries might have been received.

The president then decided that independently of the question of accepting or declining the invitation, the Council should fix at that session the date of the next Congress. It was then submitted to the vote of the Council and was adopted, as all the votes except one were in favor of the president's suggestion.

Professor Hesse thought that the invitation to hold the next Congress in the city of St. Louis, in the United States of America, should not be accepted, and further, that his opinion would have Dr. Cunningham's support. He regretted that his views would suggest an apparent lack of courtesy toward the American *confrères*, but he thought that the general interests of the International Dental Federation should be considered first, and that it was only with that purpose in view that he decided to recom-

mend the non-acceptance of the invitation. He then stated that his specific reasons would be submitted to the Council in writing.

The president stated that this question should be very carefully studied and considered before reaching a decision.

Dr. Franck stated that after having conferred with his countrymen they had reached the conclusion of accepting the cordial invitation made by the dental profession of America.

Dr. Sauvez expressed himself plainly and definitely as being in favor of accepting the invitation.

Dr. Förberg said that as the reasons given by the members who opposed the acceptance of the invitation were not in any way so important as those advanced by the members who were in favor of holding the Congress in St. Louis, the invitation should be accepted.

The president submitted the question to the individual vote of the members, with the result that the invitation was accepted by six votes against two. The Council then appointed a committee composed of Drs. Hesse, Aguilar, and Sauvez, to prepare the acceptance to the invitation addressed by the National Dental Association of the United States.

The Council then proceeded to the election of officers for the ensuing year. The result was as follows: President, Dr. Ch. Godon; vice-presidents, Drs. Florestan Aguilar and Franck. Dr. Sauvez was elected secretary-general by acclamation.

SEVENTH SESSION—AUGUST 18TH.

The president called the meeting to order and the following gentlemen answered the roll-call: Drs. Aguilar, Cunningham, Förberg, Franck, Hesse, and Sauvez. The minutes of the previous meeting were read and approved.

In accordance with Dr. A. W. Harlan's proposition, the Council decided that in the letter which would be addressed in reply to the invitation presented by Drs. Wm. C. Barrett, Truman W. Brophy, and Eugene H. Smith, in the name of the National Dental Asso-

ciation of the United States, it should be specified that Drs. Truman W. Brophy, William C. Barrett, Eugene H. Smith, W. Conrad, Gordon White, H. A. Smith, W. R. Windhorst, S. H. Guilford, and J. D. Patterson have been designated to form a committee to collaborate toward the organization of the Fourth International Dental Congress, as representatives of the Executive Council appointed by the Third International Dental Congress.

The secretary-general read a statement signed by Messrs. Hesse and Cunningham, saying for each that he could not give consent that the F. D. I. should lend its support to the Congress to be held in St. Louis in 1904, for the following reasons:

(1) A lapse of four years after the last International Dental Congress is too short a period to warrant the holding of another congress, as the progress which has been made in dentistry since then is not considerable enough to justify the holding of another international gathering.

(2) That he could not assure the attendance of a sufficient number of members from his country to justify calling it an International Congress.

The secretary-general then read the letter to be addressed to the National Dental Association of the United States in reply to the invitation to hold the next congress in the city of St. Louis.

The document referred to is as follows:

The Executive Council of the International Dental Federation intrusted by the Third International Dental Congress with the organization of the succeeding congress, having read the invitations addressed by—

The National Dental Association of the United States of America.

The Governor of the state of Missouri.

The Mayor of the city of St. Louis.

The National Association of Dental Examiners.

The Dental Society of the State of Missouri.

The St. Louis Dental Society.

The Society of Dental Science of St. Louis.

The Odontographs of Western Missouri and Eastern Kansas.

The St. Joseph Dental Society.

These being regularly represented at the Stockholm sessions by Messrs. Truman W. Brophy, Wm. C. Barrett, and Eugene A. Smith, accredited for this purpose:

CONSIDERING, on the one hand,—

(1) That the progress of dentistry in the interval of four years seems insufficient to warrant a scientific interest in a fourth International Dental Congress after the one that was held in Paris in 1900;

(2) That it would have been desirable that the forthcoming congress should be held in a country in which a similar international reunion had not been held before:

But, on the other hand,—

(3) That universal expositions attract a considerable number of visitors from all countries, and are especially favorable to the success of international congresses;

(4) That several international congresses will be held upon the occasion of the St. Louis Universal Exposition, and that it is necessary that odontology should be represented;

(5) That no other invitation has been received;

(6) That it is desirable to reach a decision so as to give ample time for a good preparation;

(7) That the good organization of the congress is assured by the worthiness of the invitations received:

ACCEPTS the invitations, and DECIDES that the Fourth International Dental Congress shall be held in the month of August, 1904, in the city of St. Louis, Missouri, United States of America.

The undersigned certifies that this is an extract of the proceedings of the Executive Council, and that it is an exact copy of the letter to be sent in reply to the invitation received. The Secretary-General,

(Signed) DR. SAUVEZ.

The secretary-general, Dr. Sauvez, then read a letter from Dr. A. F. Caro, minister of Spain at Stockholm, requesting the Federation to take part in the Fourteenth International Congress of Medicine, to be held in Madrid. The Executive Council addressed a letter of thanks to Minister Caro, assuring him that the section on Odontology of the International Congress of Medicine to be held at Madrid would have the support of the F. D. I. The Council recommended the foreign representatives to take part in this section of the next International Congress of Medicine.

The question of deciding upon the city in which the next meeting of the F. D. I. should be held was then taken up for discussion.

Dr. Aguilar suggested that the Federation should hold its forthcoming meeting in the city of Madrid at the time of the holding of the Fourteenth International Congress of Medicine. A motion to this end was presented by Dr. Aguilar, and was adopted by seven votes against one.

Dr. A. W. Harlan made a motion to the effect that in case of death of one of the members of the Congress Committee, the other members should have the power to fill the vacancy. This motion was adopted.

EIGHTH SESSION—AUGUST 19TH.

The session was called to order by President Godon, the following members being present: Drs. Aguilar, Cunningham, Förberg, Franck, Hesse, and Sauvez. The minutes of the last session were read and approved.

The secretary-general proposed the names of Drs. Frick, Guye, and Roy for adjunct members in the International Commission of Education, the name of Dr. Heidé as a regular member of the Commission of Public Dental Hygiene, and Dr. Boedecker for adjunct member of the same commission. This proposition was adopted by the Council.

The committee on publication then presented its report relative to the publication of the transactions of the F. D. I.

Dr. Aguilar, treasurer of the F. D. I., presented a report in which it was shown that the Federation had a balance of 402.65 francs to its credit. The treasurer's report was approved.

The secretary-general then read the following communication from Dr. Haderup: "Dr. Haderup is of the opinion that a committee of three should be appointed, said committee to have power to increase its number, for the purpose of preparing an international dental nomenclature and stenography. This committee to present a report at the next meeting of the International Dental Federation, to be held in 1904."

The secretary-general also read a communication from Dr. Förberg, with reference to the publication in each country of periodical reports of the most important writings on dentistry recently published. This report could be submitted to an editorial committee which would publish them in a universal dental review in two or more languages. The bulletin of the Federation could be used for this purpose, and in that way the International Dental Federation which unites to-day the dentists the world over would also become instrumental in creating a work which would constitute the universal history of dental science. Dr. Förberg submitted this proposition to the consideration of the Executive Council. It was decided that this question should be settled at the next meeting in Madrid.

The Council then adopted the by-laws of the Federation, with the exception of a slight modification affecting the financial side and resulting from the report presented by Drs. Aguilar and Sauvez with reference to the payment of fees.

The Council also decided to introduce a modification in the laws of the Federation regarding the regular and adjunct members of the Council, in order to make it possible to appoint the delegate from Russia a regular member of the Executive Council.

The secretary-general proposed that the Council should organize several international commissions,—one on schools, one on jurisprudence, and one on statistics. The Council then discussed the question of forming an international commission on jurisprudence by the appointment of one member in each country, and that the officers of the Executive Council should prepare a report of this question to be submitted at the next meeting in Madrid.

It was then decided that the discussions should be continued in Madrid, and that the officers of the Federation should have in charge the organization of the forthcoming meeting of the International Dental Federation, to be held in Madrid in April, 1903.

The Executive Council then adjourned.

AMERICAN DENTAL CLUB OF PARIS.

Meetings of October and December, 1901, and January, 1902.

MEETING OF OCTOBER, 1901.

AT the meeting of the American Dental Club of Paris, held October 12, 1901, the following discussions took place.

Dr. WETZEL described his method of strengthening loose lower incisors by first fitting a platinum plate to the lingual surfaces and another platinum band to the labial surfaces, lining these with cement and bolting the two together while the cement which is made to fill all the interstices is soft. The bolts or screws pass between the teeth. After the nuts are screwed down the bolts are cut off and polished. This apparatus never loosens, as do wires. Dr. Wetzel also presented a model having five lower permanent incisors.

Dr. DA SILVA read a paper on "Facial Neuralgia."* Dr. Da Silva's patient suffered from most persistent and severe neuralgia, the teeth all appearing sound. He finally decided the trouble to be due to pulp-irritation and opened and destroyed the pulp of the third molar, this giving entire relief.

Dr. WETZEL (discussing Dr. Da Silva's paper). I think in facial neuralgia the success of treatment by destruction of the pulps of healthy sound teeth is very uncertain. I have done this myself, and the patient continued to

*This paper had been previously presented before the American Dental Society of Europe at Cologne and published in the *Dental Review*, 1901, p. 688.

suffer after the pulp was dead, and even after the tooth had been finally extracted.

Dr. HUGENSCHMIDT. I rather think that if by destroying the pulp of a tooth you cure the neuralgia, that indicates that the pulp was diseased and consequently the tooth not healthy.

Dr. DA SILVA. To all external appearances it was healthy. But I am referring to peculiar cases in this paper,—cases of patients of a certain age of life when, I take it, the suffering is connected or caused by troubles of the uterus or the catamenial periods. In that first case I mentioned I was six weeks before I really decided to do anything.

Dr. HAYES. It has happened to me to cure a case of facial neuralgia due to overcrowding of the third molars. A patient came to me for facial neuralgia; I thoroughly examined her, found she had a beautiful set of teeth, almost perfect. The woman was, I think, about thirty years of age. Her third molars were appearing late, and her teeth were packed extremely tightly together. It occurred to me that her neuralgia might be due to overcrowding, and I suggested that the tooth be extracted as she had practically no need of it, the set being perfect. So, with her consent, I took it out; she said the neuralgia left her immediately. It was not necessary to take another tooth out,—she was permanently relieved.

Dr. MICHAELS. I knew of a hospital patient who after suffering tortures with tic douloureux and not obtaining any relief, an eminent surgeon removed the entire maxillary bone of the affected side. This gave relief, but I was curious to find the cause of the pain. I took the piece of jaw home and dissected it. I found the point of a bicuspid root deeply imbedded, where it had been broken thirty years before, the adjoining teeth having completely closed up the space. I found the pulp of the root was alive. When the tooth had been extracted the pulp had broken, and a portion had been pulled out of the extracted part, and this hanging end had become

imbedded in the cicatricial tissue, thus causing all the trouble.

Dr. HIRSCHFELD. Do I understand that Dr. Da Silva would establish it as a general rule to take out the pulp of a healthy tooth, when one cannot account in any other way for facial neuralgia?

Dr. DA SILVA. I do not want to establish anything. I merely mentioned what few cases have passed through my hands, and which I have treated as I thought best. It took me six weeks to arrive at a proper diagnosis of the case. I got the lady's husband to help me, to say when she had the more painful attacks at home, and after six weeks' questioning and dilly-dallying, I came to the conclusion that I would destroy the pulp. I supposed that there might be pulpstones, but found none. I began by destroying the pulp of the third molars, and as the pain ceased immediately I did not need to take out any others.

Dr. HUGENSCHMIDT. Then you acted according to what the patient suggested to you?

Dr. DA SILVA. No, the patient had pain and thought it came from the tooth. Her teeth appeared to be perfect. She said, "Take them out." I said, "No, I will do the other thing first. If I destroy the pulp you will still have your tooth to use."

Dr. W. DAVENPORT. I think these cases would have been much more interesting if Dr. Da Silva had brought the models for us to see. I have an idea that the neuralgia might have been caused by the pulp-irritation due to malarticulation of the tooth.

Dr. DABOLL. I have also come across cases of facial neuralgia due to overcrowding by third molars. I remember one case which was complicated with muscular trouble. In what manner it occurred I never could make plain to myself. A gentleman came to me suffering great pain in the upper left jaw; he could not locate it, but he could not close his mouth. You could put your thumb between the teeth, as he could not bring the upper teeth and lower teeth together. He could not eat without the

greatest pain, and consequently had run down in health a good deal. When he came to me I could find nothing the matter. He had a splendid set of teeth, but I found he had a third molar which was dwarfed and only partially erupted. I thought this might have something to do with the pain. I suggested to him that as the tooth was of no use to him, we might remove it, and see what effect that would have on his pain. I removed the tooth, and immediately he could bring the upper and lower set together in a normal manner again. The pain immediately disappeared.

Dr. HUGENSCHMIDT. Fifteen years ago I had a patient suffering from severe pain caused by a third molar. I recommended extraction, and the tooth was taken out. Everything went well for some months; then the patient returned, suffering from neuralgia located first in the lower and then in the upper jaw; then it took the form of *tic douloureux*. I looked out very carefully for the cause, and one day found that in pressing in the direction of the third molar I immediately started the acute pain. I then supposed that a nerve had been caught in the cicatrix of the extracted tooth. It was in the first days of cocaine. I injected cocaine and dug through the alveolus, scraped the jaw as far as I could go and destroyed the little piece of nerve which had been caught in the cicatrix. The relief was immediate and the pain disappeared. Evidently it had been caused solely by that nerve filament.

Three years ago I had a case rather like Dr. Da Silva's. An old lady of seventy-five came to consult me; she had been traveling all the summer and had gone to about every dentist in Switzerland for relief. She had had pain in her jaw before, but when she reached Switzerland it was more located in a central tooth. When she came to me I examined her thoroughly and found that the gums had receded and the necks of the teeth were very sensitive, and thought that the *tic* was due merely to sensitiveness of the base of the teeth. I passed the thermo-cautery on the necks of the teeth.

For a week she still had pain, though less; then I used nitrate of silver, and the patient was completely cured. She had not been able to take solid food all the summer, and was cured by a simple application of the thermo-cautery.

I have seen several cases of severe neuralgia due to the receding of the gums of the palatal root of the molars, and it disappears if the whole surface of the palatal root is roughened and covered with a layer of cement; the very fact of protecting the part and keeping it free from the liquids coming into the mouth, and the inspired air, will prevent this acute pain.

Dr. LEVETT. In 1894 I had trouble with a partially erupted third molar. I could not open my mouth, and yet the tooth did not develop. It took four or five months to erupt, and it was giving me most acute pain. I could not eat. As soon as I ate a frightful attack of neuralgia came on. As soon as the tooth was extracted I was able to open my mouth quite naturally and the pain left.

Dr. DA SILVA. Was it lying in a natural position?

Dr. LEVETT. Yes, only it could not come up.

Dr. HUGENSCHMIDT. Patients often ask that two or three teeth be taken out, and I think then that it is preferable to destroy the pulp, for even removing the pulp will show whether the pain was located there, and if not the tooth is saved.

Dr. Jarré some years ago claimed that almost all *tic douloureux* is due to cicatricial tissues. After extraction of a tooth the nerve filaments get into the cicatrix, and the best thing to do when this is the case is to destroy the bone which has formed again where the tooth has been extracted, and liberate the nerve filaments.

In a case of great interest it happened that after extraction of a tooth the nerve filaments had been taken up into the newly formed bone, and the best thing to do, we found, was to destroy the bone which had formed in the place of the extracted tooth. I operated and was successful; I cannot say the patient is

entirely cured, but he is much relieved.

Dr. W. DAVENPORT. I have discovered, this last year, that at the end of the day I was very fatigued. I found I could not read in the evenings, and it finally occurred to me that this state of things was due to the fierce light used during operations. So I set to work to try and soften the light. I still have the regulation electric lamps, but have special shades arranged in such a way as to protect my eyes. To get over the difficulty I have been using asbestos shades. Take a sheet of asbestos, wet it and turn it into any shape you require, and it becomes quite hard and firm.

MEETINGS OF DECEMBER, 1901, AND JANUARY, 1902.

The meeting of December 7, 1901, was held at the office of Dr. Conrath; Dr. Daboll, president, in the chair. There was a large attendance of members and the following visitors were also present: Professor Choquet and Dr. Helot, of Paris, and Dr. Chiavaro, of Rome.

INCIDENTS OF PRACTICE.

Dr. ROBINSON. At the meeting at Dr. Wetzel's, Professor Choquet called attention to a peculiarity in articulation, handed down in his family from generation to generation, that of shortened or deep bite,—the lower incisors disappearing entirely behind the upper. At that meeting I called attention to Dr. I. B. Davenport's researches into the subject of the malformation of the mouth through reckless extraction of the first permanent molars, and suggested plates being made which would allow the molars to come up and block the bite. Since then I have had the pleasure of receiving a patient from Dr. Claude Martin, of Lyons, who, finding that the bite was excessively low, crowned all of the deciduous molars and so blocked completely the child's mouth. The child was five years of age. The effect has been marvelous. The first permanent molars have come up and are in contact, and the other day I was called upon to readjust the crown which had come off

one tooth. I thoroughly examined the case, and it is a great pleasure to me to call attention to this matter, especially as Dr. Choquet is with us this evening.

Dr. BURT. I believe Dr. Claude Martin is the originator of that system. It was brought up at the Dental Congress of Paris. I happened to be in the room where it was discussed; but he advocated the crowning to stop teeth from decaying, not for opening the bite. He caps all deciduous teeth.

Dr. CONRATH. I should like to present this case: It is a first molar in the upper jaw of a lady of eighteen. She came to me a few months ago and said her tooth was quite loose. I found the second molar erupting right under this first one, and the third molar coming up at the same time. The third molar was even more developed than the second molar.

Professor CHOQUET read a paper entitled "A Contribution to the Sterilization of Dentin in Living and Dead Teeth."*

Dr. I. B. DAVENPORT (discussing Dr. Choquet's paper). Dr. Choquet's method of practicing antisepsis of the teeth appears to be strictly scientific. He has applied the method of making histological preparations to the teeth *in situ*, in order to perfectly insure the penetration of the antiseptic which he employs. The one question which comes to me is whether in ordinary cavities in living teeth, such excessive penetration is necessary, or even harmless, as Dr. Choquet seems to think. His experience so far shows that it does no harm to the pulp. I, however, question whether in the treatment of ordinary caries it is necessary to secure such deep penetration of the antiseptic, and I believe that the methods which we have been in the habit of employing in ordinary cavities are not unsatisfactory altogether. I am sure in most cases they are quite sufficient,

*This paper was read before the British Dental Association, and is published in the *Journal of the British Dental Association* for 1901, p. 500.

and the results of years of practice seem to prove it; but, even if we cannot adopt the method suggested for ordinary caries, it seems to me that for the treatment of dead teeth we shall find it of very great service.

A vote of thanks to Prof. Choquet was unanimously passed.

Dr. E. A. BOGUE's paper, as follows, was read in the absence of the author by Dr. I. B. Davenport:

COMMENTS ON THE DISCUSSION OF "EXTENSION FOR PREVENTION."

The human teeth were designed to last through the threescore years and ten, more or less, of man's life; and unless interfered with in their development, that is to say in their structure, their composition, or their position, they generally do last, so far as decay is concerned.

A sound tooth, occupying a normal position in the human mouth, does not decay in one year, or two, or three, and rarely if ever in five or six. The first permanent molars that we find decayed almost as soon as they are erupted, were never sound teeth; their enamel coating is invariably found to be defective, and when we crush down or cut off the overhanging edges of enamel we find that it is the dentin which has decayed, leaving the enamel often in almost its original form.

Those who have examined the enamel coating of the teeth with the microscope know well how many defects, sometimes imperceptible to the naked eye, can be found in this enamel coating. Indeed it is doubtful if the dental practitioner very often sees perfectly normal teeth. "They that are whole need not a physician, but they that are sick,"—so it is the sick that he generally sees.

Again, it is quite within my memory that the doctrine was held that the cementum of the tooth would not decay, the ground for that belief being that approximal cavities were always found to have started just above (or below) the point of contact of the two adjoining

teeth. Dr. Arthur, and those who followed his teaching, cut away extensively these points of contact, hoping thereby to prevent decay, but they only transferred the point of contact to a region higher (or lower) toward the gum, when decay went on as before, only this time it was in the cementum, which had been supposed to be immune to decay.

If our friends who advocate "extension for prevention" mean by that the extension of the cavity until all disintegrated portions, both of enamel and dentin, shall have been removed, I too will uphold extension. But if they mean that they will treat the last two approximal cavities that I have seen,—which cavities were between the upper right canine and first bicuspid in the mouth of a young girl not quite fourteen years of age, and which cavities were not larger than an ordinary small pin's head,—by cutting through from the triturating surfaces and thence continuing until the cavities reach and pass below the gum, I demur.

The best surgery is that which preserves the natural organs in the best condition for the longest possible time. But this statement has only been reached after enormous destruction of life and limb.

I have a filling in my own mouth, inserted by Dr. Varney about thirty years ago, still doing well. I have a gold filling in my possession that I removed from the upper left central incisor, that was inserted by Dr. Thomas Evans forty years previously. What is now generally understood as extension was not practiced in either of those cases, or in hundreds of others that have lasted for many years that have come to the knowledge of all of us, and where proper instruction has been given to the patient in regard to dental hygiene.

I have the utmost respect for the gentlemen who seem most prominent in advocating this method of operating by extension of the cavity; I honor them and their work. But when it comes to pushing to a logical sequence their views as heretofore stated in print, I should

prefer to advocate thorough cleanliness instead of extension to prevent further decay.

In the case of middle-aged persons who have never theretofore paid any special attention to the hygiene of the mouth and teeth (which hygiene includes cleanliness as well as thorough mastication and use of the teeth), and who have suddenly become aware of the existence of large approximal cavities in the teeth (that ought to have been filled when they were small ones), and who have the means for paying, these extensive operations for the prevention of decay may be all well enough. But to put this method forward as the one to be adopted and practiced by the inexperienced beginner would seem but little short of teaching proceedings as destructive as those that were once advocated by Dr. Arthur. In short, no method can be advanced that is without flaw or that is applicable to all cases, and certainly none would be advanced by the gentlemen who advocated the method under discussion that have not features worthy of careful consideration and attention from their professional brethren.

Since writing the above I have seen a lady patient whose teeth I had wedged apart, making an approximal filling that knuckled in order to keep them apart and thus to open the bite,—which work was done in 1877 and 1878. (The present date is May, 1901.) Finding defects between the last two lower molars, I wedged them apart for examination and repair. I found upon adjusting the rubber dam and getting the separators at work, two fillings made of Fletcher's gold and platinum amalgam, inserted May 5, 1879, leaking slightly at their upper margins, while the lower margins, within two or three millimeters respectively of the gum, were intact, so far as I could discover with the finest exploratory points and magnifying glasses. Neither of these cavities was cut through to the grinding surfaces, nor was any "extension for prevention" practiced. Yet the patient assures me that she has experienced no sensitiveness or annoyance of any kind

from them since they were originally inserted twenty-two years ago.

Now for a few words further in regard to these same two teeth and the bicuspid immediately anterior and adjoining. The posterior side of the third molar was filled October 13, 1877, with the same material, and the filling comprises about one-quarter of the whole crown, beginning at the gum posteriorly and coming over to the anterior depression in the grinding surface. The front side of the second molar and the posterior side of the second bicuspid (first molars having been extracted in childhood) were both filled with gold, May 3, 1877. This gold in both instances went to the margin of the gum and came up and ended on the grinding surfaces of these two teeth, forming knuckles, gold touching gold, and the condition being wonderfully near the hypothetical condition required by "extension for prevention."

The same number of years has passed; these are adjoining teeth in the same mouth, and the environment as nearly as possible the same: what is the result?

The bicuspid and molar teeth have both decayed upon their approximal surfaces, especially upon the lingual side, and on March 29, 1884, they were re-filled with gold, again being knuckled in order to preserve as far as possible the space acquired by wedging. Decay and breakage again supervened on the posterior and lingual sides of the bicuspid, which was repaired by the use of amalgam on May 29, 1899, which operations are still standing and apparently in good order.

Now I am perfectly aware that I have laid myself open to the imputation of having been a poor manipulator of gold in the cases that failed to stand, while the *amalgam fillings* lasted; but if that be true, is it not also true that a large proportion, perhaps even a large majority of our craft, would have made no better filling than I did?

Then again, the same hand filled all these teeth, and presumably with about the same degree of skill. Why did two of the teeth decay again, the other two

not for twenty-two years? One reason I will give you, and no extension could operate to prevent the decay: The first permanent molars had been extracted, consequently the position of the second molar in relation to the second bicuspid was so changed that food accumulated between and around these teeth as it would not have done in the same mouth had the teeth occupied their normal positions.

Dr. Black, at the meeting of the National Dental Association of 1899, said that he had seen patients whose teeth after being put in order seemed to be immune to decay for several years, and then suddenly a new crop of cavities began. He did not say where these new cavities were found, but I fear some of them might have been found earlier than they were. I think we are all too prone to let little holes become big ones, not discovering them when they are small. Especially is this true of approximal cavities when the approximal sides of the teeth are somewhat flattened and the discovery of small cavities, even when suspected, cannot be assured without wedging.

For my own part, I have for many years been grateful to my old friend, Dr. Bronson, who taught that in examining the teeth each tooth should be mentally isolated from every other tooth and carefully examined as though it were the only one in the mouth, and then one should proceed with one after another until all had been examined. Pardon this digression, but it is on collateral lines with the subject under discussion.

(Owing to the lateness of the hour the discussion was postponed to the following meeting, that of January 4th. It is here appended.)

Discussion.

Dr. I. B. DAVENPORT. The formula "extension for prevention" originated with Dr. Black, whose idea seems to be that before the filling of approximal cavities they should be extended by cutting away to below the gum line and out each side buccally and lingually, in order that when restored by filling there shall

be no contact of the enamel of adjoining teeth. This paper of Dr. Bogue's contains, in brief, his ideas upon the discussion that followed the paper of Dr. Black, by Dr. Ottolengui, Dr. Perry, and many others.

The PRESIDENT. Dr. Perry in his contour operations argued that margins were safer when beyond contact, but he did not always cut to obtain that condition. He did not himself believe in the mutilation of teeth for the possible prevention of future decay.

Dr. DA SILVA remarked that "extension for prevention" is all right in certain cases. He was for one year with Dr. Perry, who always considers the quality of the tooth-tissue involved in each particular case. If it be good he cuts away, as the cavity naturally shapes itself and fills in. If later the enamel should become altered by disintegration of decay and it is necessary to refill or repair, he then cuts away the second time, extending to prevent recurrence. Secondly, if the tissue be bad, then he cuts away, clearing out with thin scalers, and extends. In brief, attention must be paid to the tissue structure. Frequently on the posterior side of the canine he cuts away the rounded portion, which often looks so nice and which is so deceptive, and replaces by contouring with gold even if there is little likelihood of recurrence.

The PRESIDENT asked if anyone could speak upon the results of Dr. Black's theory, and how far his expectations and enthusiasm had gone.

Dr. I. B. DAVENPORT replied that Dr. Black believes that decay of the teeth is quite independent of their density or quality, but dependent upon bad environment alone, and his object in cutting widely and making large restorations was to secure better environment for the remaining tissue and so prevent recurrence of decay,—in short, to make the surfaces of the teeth which are not covered and protected by fillings, self-cleansing.

Dr. DAVENPORT said that his own personal experience had led him to believe that he had too often not cut away

as much as he should have done, especially in teeth which we class as weak, but which term Dr. Black claims is based upon a false conception.

The PRESIDENT remarked that he had often felt how beneficent it would be if there existed a sort of dental Academy composed of capable men whose duty it should be to pass upon all new theories before they could be put into practice.

Dr. I. B. DAVENPORT thought there was no hope of ever finding men for such a committee sufficiently free from prejudices or one-sidedness to make authoritative and acceptable decisions, even if it were ever possible for its members to agree among themselves. Take as an illustration the historic resolutions against those using amalgam passed by dental associations at the time of the "amalgam war."

The PRESIDENT. But to-day dentistry is a scientific profession; conditions have changed since the days of the "amalgam war." Dentists were then ignorant as

compared with to-day, and then a dental office was guarded as a sealed casket.

Dr. DA SILVA presented models of a mouth in which he had placed fifteen crowns. The patient, a gentleman fifty-five years of age, of uric acid diathesis, had been ill five or six years, and the teeth were much worn and wasted, and the patient too feeble to stand much at a sitting. The pulps were first divitalized, which was rather difficult owing to the nervous state of the patient. The bite was then opened by crowning four molars. Then the incisors, and so on, but all were completed before any were permanently cemented. The pulps were opened up by the drill and removed under the influence of saturated solution of cocain under pressure.

The PRESIDENT extended his sympathy and felicitations to the doctor in his difficult and interesting case.

I. B. DAVENPORT,
Editor A. D. C. of Paris.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

THE First District Dental Society of the State of New York held a regular monthly meeting Tuesday evening, October 14, 1902, at the Academy of Medicine, No. 17 West Forty-third street; the president, Dr. Charles A. DuBois, in the chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. W. C. DEANE. I would like to exhibit the model of an interesting case which shows a tooth,—upper right central,—that has receded in its socket, although the root itself is normal. Dr. Van Woert, of Brooklyn, has taken an X-ray photograph of the case, and I have also had another photograph taken. The tooth has been receding for ten years; ten years ago it was in line with the other central. The patient is now twenty-four years old.

The PRESIDENT. Does Dr. Deane know the cause of the recession?

Dr. DEANE. No, sir, although I have endeavored to ascertain. I questioned the young lady, and asked her whether she ever received a blow on the tooth, but she said she did not remember any.

Dr. HODSON. What does the skiagraph show?

Dr. DEANE. A perfectly normal root. She has had no pain. It is a perfectly sound tooth, too,—no cavity or filling.

Dr. J. GRANT PEASE. I would like to speak of a peculiar case of a boy seven years of age. I had this boy as a patient for the first time about a year and a half ago; I did not then notice this condition. The second time he came I noticed that when the jaw closed, all of the teeth overlapped. The permanent first molars and the permanent lower centrals are present; the other teeth are all temporary. When the boy chews he strikes on the buccal surfaces of the lower teeth,

and has also been sending the upper centrals forward. When the mouth is closed the upper teeth completely cover the lower. I have an appliance in the lower jaw, which consists of two crowns with inclined plane extensions. These crowns include the lower canines, first and second molar on each side, and are connected with a bar behind the front teeth. This I thought of changing to a jack-screw later so as to throw the lower teeth out, as they have been drawn a little bit in by the action of the upper teeth. I had thought of putting an appliance on the upper jaw, but Dr. Deane this evening gave me a suggestion and very kindly offered to show me at his office an appliance for constant traction to bring the upper teeth together.

Dr. DEANE. Will the doctor state why I advised him to use that instead of the appliance now on the lower jaw?

Dr. PEASE. As a criticism or suggestion on what I have in the lower jaw at present, which articulates only with the palatal cusps of the upper teeth, Dr. Deane says it would be apt to draw the grinding surfaces of the upper molars in and throw the roots outward, and thereby tend to enlarge the alveolus. He thought by using this appliance it would at least keep the upper arch from enlarging, and might have a tendency to contract it.

Dr. HODSON. What is the objection to putting a palatal plate in the upper arch and letting the lower teeth strike against it?

Dr. PEASE. That could be done when the second teeth come in, perhaps, but I would like to put in something now.

Dr. HODSON. Is it quite certain that the upper arch is too large, anyhow?

Dr. PEASE. Yes. I think anyone could see that.

Dr. HODSON. Well, I cannot.

Dr. PEASE. I may be all wrong, of course; but that is my opinion.

Dr. CARR. Dr. Grevers is with us to-night, and he has given a great deal of attention to this very subject. He at first intended to speak on it to-

night, and perhaps he will give us some light.

Dr. JOHN GREVERS, Amsterdam, Holland. I did expect to speak on the subject, in which I have been interested for a number of years, but I left the charts which I would need at home, and brought these others with me. I have something with me which will show what is about the average size of the upper and lower jaw, and if this child is seven years of age, I must disagree with Dr. Hodson that the jaw is not uncommonly large,—I think it is larger than usual. I have measured a great number of skulls, taking groups of ten skulls of newborn infants, then of skulls from three months to one year, and so on at different ages, and put them into five groups. The subject would be more interesting to you if I had my charts with me. If we measure this mouth, I think we would find it far surpasses the average normal skull. The separate measurements are here in my book, and, at the age of seven years, I do not think I would find this normal. I think the lower jaw looks normal at that age, although it may be a little smaller. Perhaps Dr. Hodson would not agree with me there, as I did not agree with him as to the size of the upper jaw.

I must say that, in this case, the upper jaw is larger than we expect at this age, and I think I can agree with what Dr. Pease has said that the spreading is going on, and will go on, because the lower jaw passing on the lingual surfaces of the upper molars will perpetuate the spreading, and we must expect it to enlarge.

As to the treatment, excuse me; I am a man of theory, and not practice.

Dr. JOHN I. HART. Two years ago, it became necessary to extract from the mouth of a patient the upper right central incisor, owing to the necrotic condition of the root. She had the usual prejudice against a porcelain tooth, and persuaded me to use the natural tooth which had been extracted. An ordinary saddle was struck up and suitable clasps soldered to it. Opposite the root-canal

a pin was soldered on to the saddle, and after grinding the tooth so that it accurately fitted the model and gum, allowing for some absorption, and opening from the palatal surface into the pulp-chamber, cleansing it and filling with gold, the tooth was fastened on to this pin with chloro-percha and gutta-percha. To my surprise it has held its color, and has not broken off, and is lasting very well. I saw it recently. That worked so well that about three or four months afterward I tried the same experiment with another central and a lateral incisor, and that case is also doing well. I am familiar with the fact that natural teeth were used many years ago to fasten to the various bases in use at that time, but I do not know that this method is in vogue to any extent, and if it is not, perhaps others might desire to try it. If they get as satisfactory results as I did in these two cases, I know they will be glad to use it.

Dr. GREVERS. I would like to show an instrument here which has been of the greatest benefit in our university. You know if we want to accept the examination of the mouth with mirror and probe, we have not a very good test. If we want to find out if a tooth is dead or alive, we generally apply heat and cold, or else illumination. While that test may help us out in certain cases, it does not bring out the point we wish. At one of our clinics, a student suggested that if we could pass an electric current into the tooth, it would help us very much. Those who work at clinics will bear me out that it is sometimes difficult to find out which tooth is the culprit. The class of people who come to clinics at the University in Amsterdam are not the kind who take care of their teeth; in fact, they do not know much about cleaning the teeth or using a brush even. If a patient comes in with nearly all the teeth on one side decayed—the first and second bicuspid and the molars—and says the pain is on that side, very often we cannot tell which tooth is responsible. We apply cold and heat, but we get very

little instruction out of that. The suggestion the young man made was very good from a physiological basis, the pulp of the tooth being a sensory organ,—just the same as when bright light strikes the eye, we feel it and it hurts the eye,—there is no pain exactly, but a peculiar sensation. I thought if we could in a tooth apply a stimulant strong enough to be responded to by the pulp, it would be of benefit to us. The question arose, what form of electricity to apply, and the only thing I thought would do was a form that would overcome the resistance which a tooth offers to the passage of a current, and that is, the induction current. I found in Philadelphia just the thing I wanted. We needed but a small current, a little dry battery,—one of the “ever-ready” lamps. It only cost two dollars and fifty cents complete, with in addition this one instrument to apply to the teeth.

I always use the secondary coil,—not the primary,—because the current is too strong. The secondary coil is pushed out to its fullest degree and then the current is extremely weak so much so that you do not feel it at all. As we apply it, we gradually push the coil in until the patient feels the current without producing pain. That I call the weakest point. When you apply the current to a canine tooth, it takes a strong current before the patient feels it, but applied to the incisor in either jaw it is quickly felt. The same current, that they can barely feel in a sound tooth, will produce an agony of pain where the pulp is in a pathological condition, whether on account of pulpitis or pulpstones. It will be more sensitive to the current than to heat or cold. I found it of great assistance—so much so, in fact, that I cannot do without it any more.

Not long ago, a boy between twelve and thirteen years of age came to the clinic and complained about the upper first molar on the left side. The tooth was badly decayed, and the pulp was exposed. All the other teeth seemed sound, only I noticed that the second permanent molar had a discoloration in the

masticatory fossa,—not to the extent, however, of warranting the idea that there was a cavity there. I applied the current to the first molar, but the tooth did not react. The boy felt no pain. I was at a loss, because it did not turn out as I expected; but I applied the same current to the second molar, which seemed to be sound, and the response was immediate. We opened into it, found a cavity, and the boy was cured of his pain.

In one case I have in mind there was a patient in the chair, and the lower first molar had been devitalized; the student was working at it, and found the tooth to be still very tender. One of the instructors said the pain could only come from the peridental membrane, and another asked me if I would apply the current. I applied the current to the first molar, and the patient felt an agony of pain. Without doubt we demonstrated there was a pulp there. The coronal part has been taken away, but the root is there yet. When you have extirpated a pulp, and a particle of nerve is there, this instrument will find it out. When the tooth is dead the patient is indifferent to the current. If there is any life in the pulp the current produces pain.

In the University of Pennsylvania one of the visitors wanted to know whether the pulp was still alive in a tooth that was crowned, which was to be used as a post for bridge work. After the bridge was applied there was a great deal of pain, but he was sure the pulp was dead. I applied my instrument, and I found the pulp was, as you say, "alive and kicking." We applied the current to a tooth which was dead, and there was no sensation.

I apply the positive to the tooth and the negative is held in the patient's hand. In the primary coil there is a positive and negative. The Queen Company does not give you a handpiece to apply to the teeth, so I found at The S. S. White Company's depot this little piece for cataphoresis; but you can make it yourself of German silver wire and solder to one end a tube to hold a little cotton.

You wet the cotton and apply it to the tooth.

Dr. E. A. BOGUE. On the steamer coming across I had a third molar extremely sensitive to heat and cold. I found the barber had some chewing gum, and I put that between the teeth for three or four days, and the pain passed away. That is all I know about it. Now will Dr. Grevers tell me if it is dead or alive?

(Dr. Grevers made an application of the current to Dr. Bogue's tooth and found it responded.)

Dr. GREVERS. I ask the patient to give a sign when he feels the current in a sound tooth. I find as a rule that between numbers two and five the tooth feels the current. With the instrument we are able to detect a much finer pathological condition than by any other means. Where there is a filling, I do not apply the current to the filling, but to the enamel. Where the tooth is filled, there is greater sensitiveness.

If I had a person here who had pulp-stones, or anything of that kind, or a tooth in a pathological condition, you would see the great benefit of the instrument. I have used it in the university clinic over seven months, and I also have one in my office. It is merely an induction battery. It is made by the Queen Company, and is the best form I have found for my purpose.

Dr. PEASE. You said, doctor, that you could diagnose the condition of a tooth. Suppose the patient has a filling between the teeth, and you place that current over the filling, that would indicate that there was some trouble with the tooth, would it not? If you wanted to diagnose a case of toothache, and you placed the instrument on several teeth, and the patient has a filling between the teeth that is obscured by the teeth coming close together,—if you placed the instrument on the tooth it would respond as my tooth did; you might diagnose that tooth as one that needed filling.

Dr. GREVERS. You have not caught my idea. It does not apply to a sound tooth. If you came to me and com-

plained of pain on that side, and you could not locate the pain, this is a better test than heat, cold, or light. I would apply this weak current to all the teeth and then increase it, and would find that the sound tooth would not respond, but the tooth next to it might respond quicker because there is a filling in it. I do not apply it to the filling, but to the tooth itself.

Dr. PEASE. Will the saliva not conduct the current along the moist surface of the tooth to that filling, and so make a tooth with a filling in it more sensitive on account of having the current conducted along the filling?

Dr. CARR. The gentleman means, could you not be mistaken in thinking the tooth might be in a pathological condition, when it only had a filling in it and therefore responded to the current?

Dr. GREVERS. If the pulp were in a normal condition, that tooth would not respond to a weak current, but the tooth next to it, where there is a pathological condition, will respond, because there is an increased energy or activity. It is more sensitive than a normal tooth, because its function is intensified.

Dr. BOGUE. Dr. Grevers perhaps would offer that instrument as a diagnostic instrument for a case such as I had this afternoon: A lady for six months has been complaining of pain. I suspected it was the left central incisor, but as the tooth had been filled by someone else, I knew nothing of its anterior treatment. I tried transmission of light, and heat and cold. You would have tried the instrument and incidentally discovered that the pulp was dead. It is another case like my third molar, which you discovered was alive. It is, you say, in a pathological condition, yet I cannot do anything. If a gentleman undertakes to amputate a living pulp, if he thinks he has it all out and the patient still suffers pain, that will tell whether there is any pulp alive there, or not?

Dr. GREVERS. In my own case, my assistant applied arsenic to a tooth, and Dr. Carr will tell you that I had a good

deal of pain while I was at his home in Centre Moriches, L. I. I could not stand heat or cold. We tried to extirpate the pulp. On my way to Niagara Falls, and on my way to Philadelphia, I felt the peculiar sensation of the tooth being a little longer. In Philadelphia they took out the gutta-percha, and I have since been free from pain. I can again masticate, and this instrument has shown that my tooth had a part of the pulp still alive. It does not react now. The strongest current was tried at the University of Pennsylvania, and they said the instrument was not good, because it did not react.

Dr. NASH. Did your demonstration on Dr. Pease not prove that there was a difference between the filled and the sound teeth, although you applied it remote from the filling? Would not that condition be likely to deceive you? The patient evidenced shock when you approached the filled tooth. It might not be sufficient to demonstrate that the condition was pathological, but in dealing with nervous patients who are on the lookout for trouble, would they not be likely to jump?

Dr. GREVERS. You commence with a very weak current. That same weak current will produce pain, but not acute pain as when the current is stronger. The cases of neuralgia, for instance, when you cannot find any reason with the ordinary test,—this instrument will help you out.

Dr. NASH. I understand that, but at the same time those filled teeth did respond to a greater degree than the unfilled teeth. That shows that it simply aids your intuitions. Very often in tapping on a tooth we can almost tell from the sound which tooth is responsible for the trouble. It is the intuition that guides us as to which tooth is involved. You would expect in using this instrument that you would get something more than ordinary pain. You would get an extreme pain,—a great shock,—such as the boy experienced at your clinic. Might there not be some confusion in the diagnosis, even with this instrument? Is it absolutely positive?

Dr. GREVERS. Yes, it is positive. In this third molar there is a cement filling, which is not a conductor. That tooth responded at once, and that shows that the pulp is in a pathological condition and is probably dying. If Dr. Bogue were complaining of neuralgia, and we found this was the tooth, your intuition would not help you much in this case.

Dr. NASH. But suppose you got a case in which there was no positive condition of neuralgia,—a sort of irritated condition? You pass this through the mouth, and you get a sensation such as Dr. Pease experienced. Might you not be led into opening teeth unnecessarily?

Dr. BOGUE. I think I can understand what Dr. Nash means. I do not think Dr. Grevers is showing this to us as an instrument that is going to be used every day by us. In his clinic at the hospital, yes; but in our private practice, no. I had a case come to my mind, as Dr. Nash was speaking. Three years ago, one of our Berlin friends sent a distinguished Russian by telegraph into my hands in Paris. He had put him thoroughly to rights, as he thought, when he left Berlin. I saw nothing amiss when he came to me; he came again, and still I found nothing. The third time he came and insisted that there was something wrong. I finally found that the upper left first molar had a diseased pulp which was not yet dead, while every other tooth was in good condition. With that instrument I could have found out the offending tooth at once.

Dr. S. L. GOLDSMITH. I think many men who have been using cataphoresis have been using this very method, but with the galvanic current instead of the faradic, and I think it is a very positive diagnostic means to have at our disposal. As to the question of the amalgam or any metallic filling in a tooth, Dr. Price pointed out some time ago that the point of reaction of a pulp is a certain specific amount. A pulp will stand a certain fraction of a milliamperé before it will react. This is more difficult to ascertain when using the interrupted current. If

a tooth reacts with the one-twentieth part of a milliamperé, and a healthy tooth in the same mouth and about the same size does not react until it has four-twentieths or five-twentieths, you have something definite upon which to form an opinion. If there be a metallic filling present, and the distance between the point of application of the current and the filling is slight, the difference in the resistance of that tooth and a normal one is considerable, several ohms perhaps, so that a current of the same tension would force a current of much greater magnitude through it. This fact should not be lost sight of in making a diagnosis.

I do not doubt that the little battery shown furnishes us a diagnostic agent of much importance.

Dr. GREVERS. I applied the current to another tooth which had a gold filling, a second bicuspid in the lower jaw, near the cervical wall. The current was not painful. But cannot we accept this filling as a very large filling and a very deep one? Cannot we then accept that this pulp is not as healthy as in a tooth that has not a filling in it? Although the tooth may not be giving trouble, it is not the same as a sound tooth. It is tender, and when I touched the gold filling you would feel it quicker than on the enamel. As I said before, I cannot do the subject justice, because I ought to have a clinical case. I am applying it here to sound teeth. If I had a patient who had a diseased tooth, you would see the difference.

In the case of Dr. Bogue, there is a tooth in a pathological condition, although not giving him positive pain, only annoying him somewhat. There is a cement filling in it. In the case of the gentleman in Philadelphia who thought the pulp had died in the molar which had been used as a support to a bridge, we found the pulp alive. Where we are in doubt this plan will help us to ascertain whether we have a dead tooth or not, because a dead tooth will not respond to an electric current. I thank you for the attention you have given me.

The subject I want to treat of to-

night is certainly interesting enough to bring before this society. At this time, when we are specializing, this subject may be more to the taste of those who only practice orthodontia, but I think for the general practitioner, too, it is good to have the subject treated so that we may have a common understanding.

I find in discussions in societies a great deal of confusion, because we have no clear conception of what is meant by the various descriptions of irregularities of the teeth. One speaks of a certain condition with one name, and another has another thing in mind. Take, for instance, protrusion. One says it is a projecting of the upper jaw, while others apply it to the lower jaw. Still others call that condition prognathism. This is confusing, for I can imagine various forms of protruding upper jaw which are not at all alike.

We must in our discussions and in our nomenclature have definite ideas of definite subjects. I found, in the various museums, a varied number of pathological skulls. It struck me that these pathological skulls could be brought under one species or genus, in which we find differences. The fact is that what I will give you this evening will make a little change in the nomenclature; but as the nomenclature is based on a language which we all understand somewhat, the Greek, you in America and I in Holland would understand it; whereas if everyone uses a nomenclature peculiar to his own language, there is confusion. When the Germans speak of a certain condition, they call it "geisenmund," which means "old-age mouth," but you would probably not understand the term. In a learned profession such as ours there should be harmony in the nomenclature. This nomenclature would bring all differences in occlusion in the teeth under a proper head.

I make use of the Greek word "harmosis," which means harmony, as a basis. I considered the upper jaw as fixed, and the lower jaw as movable. The teeth do not articulate; they simply come together. This harmonizing or coming together may not be (as our ac-

cepted term) normal. The starting-point, therefore, we call en-harmosis. Here we see the upper teeth covering the lower ones at a little distance. We start with a normal condition; and now come to an abnormal. The line here gives the distance which the upper teeth cover the lower. We can imagine the upper teeth pushed forward, and here are the different degrees where the teeth project. When I say di-enharmosis, it means "di"—away from, standing out. The different degrees I have demonstrated by the letters l, m, g, and gst. When you say di-enharmosis, you know the upper teeth are standing away from the lower in this distance, covering the lower. When you speak of an upper protrusion, we are in doubt; but when you speak of di-enharmosis, with the adjective "little" or "great," we understand at once what we are talking about.

Then we may have another condition; the upper ones slide over more than usual, as is shown here. Then you get another, different form and the different degrees. If I had a lantern I could show you skulls where all these conditions are reproduced.

Another condition may arise, which I think will make it clear that this nomenclature will cover every case: We can have these two conditions combined where the lower teeth are covered more than the normal but the upper jaw is projected forward. This is called dys-di-enharmosis. We understand at once what it is. We know the lower jaw is covered by the crown of the upper teeth entirely. I notice often in the journals discussions of protrusions and their treatment. The treatment must be different in the upper from that in the lower; but if we would undertake to correct such a condition as shown here, we must have a different treatment. If these teeth were drawn backward they would be in alignment with the others, but they would not be right. If a system were adopted whereby there would be no difficulty in understanding each other we could make better progress.

In the next case you have the reverse. Here the upper teeth are normal. The

lower ones cover the upper ones, as we sometimes find. We have different forms where the lower teeth are projecting more and more. This form of occlusion I would call eph-armosis. Here we have the same degrees as in the other instance. We might find also that the lower teeth cover the upper entirely. Again, we would use the adjectives, whether the tooth is entirely covered, or half, or three-quarters.

Here we have a combination of the two. The normal condition is called enharmosis, and where the lower jaw is in front we call it eph-armosis. If you say "projecting lower jaw" it might mean any of these cases, but if there were distinct names I would know exactly what kind you meant.

The next form is given here. It is the oldest form of tooth-occlusion. In the very old skulls, as old as the Egyptian mummies which I have seen, the normal occlusion was the teeth standing one on another directly, not overlapping. That I would call pros-harmosis,—that means an edge-to-edge bite.

Here is the simplex, the normal pros-harmosis. Now we might have the lower jaw projecting in another condition. These are the several forms of the occlusion of the teeth, with the variations shown here.

The next form is really not an occlusion, because the teeth do not meet. It is called oph-armosis,—“op” in Greek meaning an opening. We can get the proper names by the different adjectives of degree.

The nomenclature given by Dr. Angle, although very good, does not cover every case. It is a long-felt want to have a good nomenclature. It is proved by history that Heider, in 1752, in the University of Heidelberg, tried to do such a thing. After him came Sternfeld, and he used the terms that we use in ethnology. In making use of the words prognathism, etc., anthropologists have a definite meaning, as laid down by Pritchard in 1855, where he speaks of it in relation to the colored people we see so much in your streets; but there is a harmony there; prognathism cannot

exist only in one jaw and not in the other,—not where one part is missing.

I would like to pass around a few of the slides I mentioned. Here is a case designated in the Museum of Paris as alveolar prognathism, — nomenclature used by Magitot.

Here is the handbook of Topinard in Anthropology. We dentists know at once that the first one he shows is a normal mouth, and it is simply by the way of measuring that he comes to the conclusion that we all suffer from prognathism. That, I wish to impress on you, is entirely different.

In this case of dys-enharmosis there is abnormality in direction of the teeth, too. In that picture there is no prognathism at all. It was probably caused by the biting of the lower against the neck of the teeth, by which they are brought outward.

I do not think you will have any trouble in locating in my classification what really belongs to each class.

Dr. CARR. I move the society extend a vote of thanks to Dr. Grevers for his able and instructive paper.

The motion was unanimously carried.

Dr. FOSSUME. I have a case where there is medium oph-armosis. The gentleman is twenty-one years of age, and all the teeth back of the canines occlude perfectly. The six anterior teeth do not meet at all. They are probably one-sixteenth of an inch apart. He wants his front teeth to meet so he can bite. Can you tell me how that can be done? All the other teeth meet, but the six central front teeth stand apart that distance. The arch is normal.

Dr. GREVERS. As he is twenty-one years of age, I think it is nearly impossible to bring them in proper condition. And here comes in the beauty of my nomenclature. If he is in this condition you cannot do anything at all, unless you do as Dr. Claude Martin, in Lyons, —elongate them. At about twenty-six or twenty-seven years he has, by applying a little band around the tooth and a little pinhead soldered to it, drawn the teeth down with elastic. At the age of

twenty-one that procedure would not be detrimental to the teeth. I know Claude Martin has done it with two teeth.

Dr. FOSSUME. In my case it would be twelve teeth.

Dr. GREVERS. The upper teeth would travel one-eighth and the others one-thirty-second; then you would get this condition of pros-harmosis.

Dr. FOSSUME. That would be satisfactory.

Dr. GREVERS. Have you noticed how the patient keeps his tongue?

Dr. FOSSUME. He has been a mouth-breather for many years, but was operated on in Berlin last summer and is much better now. But he talks like the mouth-breathers do, with a nasal tone.

Dr. GREVERS. Has he a habit of pushing the tip of his tongue between the teeth?

Dr. FOSSUME. I have not noticed such a habit.

Dr. GREVERS. I would impress on the gentlemen present to give a little more attention to the condition of the tongue. I cannot go into it now, but we have overlooked that mighty organ, the tongue.

Dr. PEASE. Would the influence of the tongue be exerted on the lower, as well as the upper, or mainly on one of the jaws?

Dr. GREVERS. The upper jaw, and not the lower, is affected by the tongue. I should not be surprised if your patient had a large tongue, and the tongue would mold the teeth. Any pathological condition of the tongue will affect the teeth. I could show you a photograph in the Royal College of Surgeons in England, where there is a tumor at the tip of the

tongue which has spread the front of the mouth in the form I show you here. Where the tongue is normal no change has taken place, but where the tumor is the jaw has spread and even has been brought down. Upper and lower jaws have both been changed.

Dr. PEASE. What steps do you take in a case of that kind, where you notice the tongue is influencing malformation?

Dr. GREVERS. I do not know. I can only give the result of my investigation. I have not taken the practical side of it, but it has only been my observation, and we could later come to a conclusion. The tongue could be operated on. I have a case of a boy ten years old, where the parents were anxious to have something done. If they could change the tongue, I could change the teeth. The mouth is enlarging all the time, keeping step with the tongue.

Dr. HODSON. I have in mind a case which entirely disproves what the professor says, that the tongue would have influence only on the upper jaw, or upon the upper teeth. A number of years ago I knew of a young woman who had lost, I think, the canine,—anyhow, it was one of the side front teeth, and she was exceedingly sensitive in regard to it. She would not wear anything to fill the space. She never was a patient of mine, but some years afterward I found, in consequence of putting her tongue in that place as a matter of sensitiveness, she had enlarged that space so you could place three teeth where one had come out, and made a rank deformity.

Adjourned.

B. C. NASH, *Secretary*.

THE FOREIGN RELATIONS COMMITTEE VS. THE EDITOR OF THE COSMOS.

THE criticism of the editor of the *Cosmos* upon the work of the Foreign Relations Committee, the reply from the secretary of the committee, and the comments upon that reply by Dr. Kirk in the November issue of the *Cosmos*, in-

volve a matter of so much importance to the dental educational interests of America and of the world, that the Foreign Relations Committee cannot let the controversy rest without the following statement:

Dr. Kirk acknowledges that he was mistaken when he said in his original criticism that the committee had no data upon which to judge of foreign educational methods. He practically admits that the committee did have such evidence, that it was satisfactory to the Faculties Association, but perhaps not clear to individuals. After other unimportant statements, Dr. Kirk comes to the consideration of the real point in the controversy, *i.e.* Has the Foreign Relations Committee, in its decisions as to what advanced standing should be given the foreign students who seek admission to American dental colleges, acted in fairness and justice? This is the question at issue which the committee earnestly desires shall be fully understood by all those interested, and be discussed without bias or prejudice, for the best good of dental education generally and quite regardless of the way in which it may interfere with personal or individual interests.

Before the organization of the Faculties Association there was a tendency in our dental schools to debase the standard of admittance by bidding against each other in the reception of foreign—and indeed native—students. They were competing with each other in extending recognition, and sometimes received students to the senior classes on irregular or insufficient certificates of standing. (We then had a two years' course, and if advanced standing was given at all it must be to the senior course.) This created a great scandal; in many instances students from abroad would present pretentious documents in foreign tongues which really represented nothing which of right could be accepted as an equivalent for our courses, but which they, falsely perhaps, represented to be a certificate of the completion of some recognized or unrecognized course of study, and upon it received advanced standing and the degree of our schools after a very brief course. This resulted in almost the ruin of the reputation of our colleges and of the distinctive American degree. American dentistry and the American degree became a stench in

the nostrils of foreigners. In certain portions of Germany an American degree was a positive detriment instead of an honor.

It was at this juncture that the Faculties Association was formed. It has done incalculable good. It is removing the reproach that the D.D.S. is easily attained. We wished to establish to the satisfaction of Europe that our diploma meant something and was worth something. Europe had nothing like it. Their own courses led to no distinct degree; ours did. Therefore we must be cautious in accepting theirs as equivalent; that is, accepting courses that ended only in license to practice as equal to a distinct doctorate degree, the D.D.S. It has been along these lines that the Faculties Association has been working in connection with its other duties, and the Foreign Relations Committee has been strenuous in its efforts to second such work. It is not true that the committee has drawn an arbitrary line, even accepting Dr. Kirk's definition of the word "arbitrary." It is not true that the committee established the rule of one year's advanced standing to all European schools. We did exactly the opposite. We took up each school separately and considered each case on its merits. We recommended, and the Association adopted, a scale of "foreign equivalents" as published in the report for 1901, and also a scale of "minimum requirements," and the students completing the course of any school coming up to these would be admitted to senior standing. But no school came up to them. There was none which made prosthetic teaching obligatory in the schools, as a prerequisite to a certificate which should or might be accepted as a qualification for practice. We could not accept a course outside the college for more than half the equivalent of ours. We recognize the fact that some schools were on the road to adopting prosthetic courses as a part of the obligatory curriculum, and we gave notice that as soon as this was done we would recommend further credit. Up to this time no foreign school has established such obliga-

tory courses which can be accepted as the equivalent for ours. They have provided them in one or two instances, but they are not absolutely obligatory.

This year the committee reported that as next year we go to the four years' course, and as this would entail a revision of our relations to other schools, it was not wise to attempt any further change this year, even had any school at a recent date provided courses that we thought requisite. The committee has not asserted and does not hold that graduation in any foreign dental school deserves no higher credit than that "reached at the end of a freshman year in an American school." We have drawn no such straight line as Dr. Kirk says. The fact is, the committee does not give any credit whatever to some recognized foreign schools, and while it is true that we have advanced foreign students no farther than the junior class, we have drawn no arbitrary line. Dr. Kirk desires to place foreign students who have completed the course for license in their home country in the senior classes of the schools of the United States. He ignores the fact that the system of education, the professional demands, and the methods of practice in most European countries are widely different from ours, and that what fulfills their requirements may be quite insufficient for ours. It is difficult to see how he can be justified in the premises he assumes. It is not probable that he contends that the student who completes the course of the foreign dental schools should be placed upon an equality with a graduate, and yet that is evidently what he is trying to do. A graduate of a reputable American dental college, if he desires the degree from any other dental college in America, must enter the senior class and take the senior course. Does he claim the same advancement for the foreign student? He surely should not do this, for the foreign student has completed his course for

license under very different requirements. He has perhaps obtained credit for a sometimes doubtful pupilage with private instructors, and has really not more than two years of actual obligatory attendance at college, with most of his lectures from medical men exclusively. And yet Dr. Kirk would put the graduates of all American dental colleges upon the same basis as these students completing a course that is not equivalent to ours.

An American who may be an accomplished practitioner of twenty-five years' standing, or who has passed successfully the rigid examination of a state board, can have no credit whatever when he enters one of our colleges; and yet the foreigner who is only ready to license may be placed in our senior class. This might be profitable, but it is not justice to American students, schools, or state dental examining boards.

In concluding, I reiterate what I said in my original communication: "The committee has ever been on the alert to modify its recommendations respecting equivalents as soon as definite information respecting the added work of foreign schools is at hand." "This will be carried out in the future as in the past, and the committee will endeavor to do entire justice to foreign students who come to American schools seeking credits which the committee at present deem unwise and unjust."

Concerning the whole matter in question, it will surely be the wisest course for the Faculties Association and its Foreign Relations Committee to err, if they do err, upon the safe side of the question, and to be very, very cautious lest the reputation of the American dental colleges degree be again discredited abroad, and more German-American Colleges once more put us all to shame.

J. D. PATTERSON,
Sec'y Foreign Relations Committee.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

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EDWARD C. KIRK, D.D.S.

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PHILADELPHIA, JANUARY, 1903.

EDITORIAL DEPARTMENT.

THE DENTAL COSMOS.

WITH this issue we present the DENTAL COSMOS to its readers in new dress and at a reduced subscription price, and as all innovations necessarily give rise to various responses indicative of approval or disapproval, regret or pleasure, we feel justified in saying a word editorially upon these departures from former methods, more especially because some who have been loyal friends of the COSMOS for years have expressed anxiety lest the changes referred to might indicate a change in policy with regard to its standards and character.

It has been the fixed policy of the Editor to confine all matter respecting the conduct and aims of the DENTAL COSMOS to the "Publisher's Notices" which have been printed from time to time as occasion has required, and thus leave the editorial department unhampered for the discussion of subjects of more direct interest to the dental profession at large. But under the present circumstances we ask the indulgence of our readers for a brief exposition of the field of work which it is the effort of the COSMOS to occupy and acceptably fill.

Since its first issue in August, 1859, and indeed beginning with its predecessor the *Dental News Letter* in 1847, the DENTAL COSMOS has had but one principal object, that being to serve as an exponent of the best in dentistry; and wherever the best was to be found, the COSMOS has endeavored to record and promulgate it. Its forty-four completed volumes are a repository of every important advance that has been made in our profession within the period which they collectively cover. The development of dentistry and that of the DENTAL COSMOS since its first publication are coincident.

The period has been an eventful one. If we may date the birth of dentistry with the founding of the first college, the first society, and the first

journal in 1839-40, then the DENTAL COSMOS, "devoted to the interests of the profession," has reflected its growth from infancy, through the period of adolescence up to a strong and vigorous independent maturity. Like all other professions, dentistry began as an art characterized by a superior handicraft in the doing of operations mostly of a restorative character in repairing the ravages of disease upon human teeth. These achievements in the manipulative phase of our work have been faithfully chronicled in our pages. Their extent is so considerable and the development of dental art so thorough, that, though we may not safely say that further progress is impossible, yet the multiplicity of methods and devices at our command would seem sufficient in number and adequate in kind to meet all the exigencies of practice. Along with the development of the art side of dentistry has grown its political and social organization, its means of education, and its standard literature. As a natural outgrowth of these came the demand for the recognition of dentistry as a separate and as sometimes stated "independent" profession,—its right to a place of equal status among the kindred specialties of the great healing art.

But much was yet to be done. Thoughtful men in dentistry, while recognizing the intrinsic importance of their work as a department of healing, and knowing that it was a department having direct relations to bodily health, nevertheless felt that the recognition demanded for dentistry would not be accorded until the dental profession itself by its demonstrated results should make evident the scientific basis on which it was grounded, and until the educational equipment of its practitioners was such as to inspire public confidence in their ability to intelligently cope with the disease conditions the right to treat which they had taken upon themselves.

Recognizing the conditions referred to, the editorial management of the Cosmos, especially for the past decade, has made it a policy to direct its work in accordance with the ideal of a high professionalism for dentistry based upon the scientific method in dealing with all questions upon which the practice of dentistry is based. In the publication of matter, selection has been made as far as possible of those features which tended directly or impliedly to enforce the utility of the scientific method—to set forth the relation of cause and effect in the phenomena with which we have to deal, and to bring into orderly and rational arrangement the truths with which we are fundamentally concerned. In so far as we have felt called upon to deal with these questions editorially it has been done in the hope of inspiring not only a respect for the scientific method of study, but also a faith in its results as the only safe basis of practice.

In the important field of dental education we are committed to the policy of upholding the principle of a broad, comprehensive, and thorough education for the dental practitioner, both preliminary and technical. Not only his claim to professional status, but his usefulness to the community, depends upon his knowledge and his ability to put what he knows into effective use, and we are further emphatically in favor of judicious special legislation as the best conservator of dental education and the protection of the public against the

incompetence of those who would practice dentistry solely as a commercial enterprise and not as a humane profession. In so far as its editorial conduct can aid in the enforcement of these principles, which we believe are the motive forces of dental professional development, the DENTAL COSMOS will as in the past continue to exert its influence.

We have been content to let the DENTAL COSMOS speak for itself, believing that to the extent that its policy and its ideals were reflected in its output of matter they would be understood and appreciated. And so they have been by the very great majority of its readers. We have not attempted to please everyone with every issue, for we do not try to attain the impossible, but we do endeavor in each number to supply some need of every reader. We recognize that dentists are human, and even though specialized as professional men they are endowed with a variety of intellects and consequently a variety of needs and tastes; it is therefore our effort to present in the aggregate a *menu* of dental literature from which each class of readers may from time to time select that which suits their fancy or individual need.

As our experience has grown and our knowledge of the demands of the profession has correspondingly increased, we have endeavored to adapt the Cosmos to the wants of the profession as we have understood those wants. The whole character of dental literature has been much modified even during the past decade, indicating a decided change in the mental attitude of the makers of dental literature toward their work. Ten years ago the suggestion that it would benefit dentistry if a fund for the promotion of scientific research were established would have been looked upon by the great body of the profession as the erratic dream of a few faddists; to-day there are ample indications that the great body of the dental profession looks to the promotion of scientific research and the results to be attained therefrom as the surest way in which to obtain knowledge of practical value. Our schools, our societies, our journals, as well as individual researchers, are rapidly working a change in the professional attitude of mind which is so rapid as to be well-nigh revolutionary.

The changes which have been recently made in the DENTAL COSMOS, even the material features of the present issue, are in harmony with the changed order of things to which we have referred. We have been congratulated and we have been criticized for the change in form and for the change in subscription price. We are grateful for the appreciation of this new departure which we have most substantial reasons for knowing is generally felt.

It is our aim and desire in so far as it may be possible, to print a good dental journal and with all the resources at our command make it so attractive that even the carping critic may be beguiled into enjoying it for the good it contains. Its standards, its policy, as here outlined will be maintained. Its motto is still retained upon its cover as indicative of its purpose; and that there will be no falling off in the excellence of its literary and material make-up we offer the present number as evidence, and as an earnest of what is to follow.

DR. PATTERSON'S STATEMENT.

WE publish at page 64 a further statement by Dr. Patterson, in criticism of our editorial position regarding the policy of the Foreign Relations Committee of the Faculties Association, and after carefully analyzing his defense of that policy we are quite content to let the controversy rest at this point, believing that the arguments and evidence brought out on both sides are quite sufficient to enable those who are candidly interested in the issue to arrive at a just decision as to its merits.

MEMORIAL TABLET OF DR. WETHERBEE.

THE members of the Boston Dental College and Tufts Dental Alumni Association, at the first annual meeting held in the new Tufts Dental School building, June 17, 1902, subscribed a sum to be used for a tangible expression of the union of the old Boston Dental College with Tufts College Dental School, by placing in the new building a bas-relief portrait of ex-President I. J. Wetherbee, the founder of the original school.

The death of Dr. Wetherbee within ten days from that time made the act doubly a memorial. The bas-relief, which we reproduce as a frontispiece, was placed in position in September, without any attending ceremonies, but we are informed that appropriate action will probably be taken at the next annual meeting of the Alumni Association.

OBITUARY.

DR. J. W. HUNTER.

DIED, September 20, 1902, at his home in Salem, North Carolina, J. W. HUNTER, D.D.S., at the age of seventy-six years.

Dr. Hunter had sustained injuries by falling from a ladder, about a month previously, which were of so serious a nature that they ultimately resulted in his death. He was a native of Forsyth county, having been born near Bethania. In 1851 he moved to Salem and entered the office of Dr. Samuel Martin. He was with Dr. Martin as student and assistant until 1856, when he was graduated from the Pennsylvania College of Dental Surgery. Being naturally ingenious, his industry and application secured him a place among the foremost operators in North Carolina, and he soon established a remunerative practice. He was of quite retiring habits and thoroughly conscientious in the discharge of all his duties.

It is interesting to note that during the Civil War he was subjected to the requirements of the conscript laws of North Carolina, and was ordered into the service of the army by an enrolling officer. He claimed exemption on the ground that he was practicing a medical specialty, and was therefore entitled to exemption; the law providing that physicians were not included in the provisions of the Conscript act. The case was taken to court and was ultimately decided in favor of Dr. Hunter by the Supreme Court of North Carolina, the opinion being rendered by Chief Justice Richard M. Pearson, who is believed to have been one of the ablest jurists of North Carolina.

Dr. Hunter was for thirty years dentist to the Salem Female Academy; was a member of the State Dental Society, having been twice its president, and also treasurer of the same for a number of years. He was also a

member of the North Carolina State Board of Dental Examiners, since its creation in 1879 until two years ago, when he resigned. At the time of his death he was a member of the Southern Dental Association. He was married to Miss Josephine Siddall, who, with one married daughter, survives him.

Dr. Hunter was an honored member of St. Paul's Episcopal Church of Salem, where the funeral services were conducted by the rector, and his remains were interred in the Salem Cemetery.

DR. HARRY HUBERT HERREN.

DIED, at Pasadena, Cal., November 27, 1902, from tuberculosis, HARRY HUBERT HERREN, D.D.S., aged twenty-eight years.

Dr. Herren was born in Smith county, Kansas, March 20, 1874, and moved to Pasadena, Cal., in 1886. He went to Chicago in 1896 to begin the study of dentistry in the Chicago College of Dental Surgery, from which he graduated in 1899. He was associated with Dr. John S. Marshall of Chicago for two years. While in college he devoted considerable time to the study of orthodontia, and was the first student of the Chicago College to demonstrate to his own class.

He moved to Los Angeles and took up the practice of his chosen profession, making a specialty of orthodontia, and was associated with the dental department of the University of Southern California for two years, as an instructor in that branch, when his health

compelled him to resign. He was one of the most active members of the Los Angeles Association of Dental Alumni, and was elected its president in 1901. He was also a member of the Southern California Dental Association. He was married in Chicago to Miss M. Victoria Ackerman, who survives him.

Resolutions of respect and sympathy were adopted by the Los Angeles Association of Dental Alumni.

DR. H. M. RAGON.

DIED, at Bath, Me., November 22, 1902, from shock induced by accident, Dr. H. M. RAGON.

Dr. Ragon was born in Bath September 3, 1840. About 1868 he began the study of dentistry with Dr. A. C. Bates of Bath, and in 1871 entered upon the practice of dentistry in that city. He was married in 1863 to Miss Mary E. Kingsbury of his native town, and is survived by his widow and one son.

In 1864 Dr. Ragon enlisted in the navy as ordinary seaman on the frigate Colorado, and after rendering efficient service in the navy was honorably discharged, June 6, 1865, at the close of the war. He was a popular man, kindhearted, and his abilities as an entertainer made his services in a social way much sought after. He was a member of the Knights of Pythias, the Masonic order, and the G. A. R. He was a loyal citizen, a good neighbor, and a man who will be greatly missed in his community.

DENTAL LEGISLATION.

SOUTH AFRICA.

COLONIAL MEDICAL COUNCIL: RULES AND REGULATIONS.

[THE existing Regulation No. 8, published in 1894, under the provisions of Section 20 of the "Medical and Pharmacy Act, 1891," is superseded by the following:]

8. All dental diplomas registrable in the colony shall be required to cover a minimum curriculum of three years; and such three years shall comprise either four half-years, or two summer and two winter courses of

lectures, or three continuous sessions, in different years, of nine months each; and in all cases a preliminary examination must have been required.

ADDITIONAL REGULATION.

No diploma granted by the government or any university or other body of a foreign country shall entitle the holder thereof to registration as a medical practitioner or dentist in this colony, unless equal rights and advantages are given in such country to the holder of any British registrable degree.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Revue hebdom. de Laryngologie*, Paris, 1902.]

A MOLAR IMPLANTED IN THE ORBITAL WALL OF THE LEFT MAXILLARY SINUS.

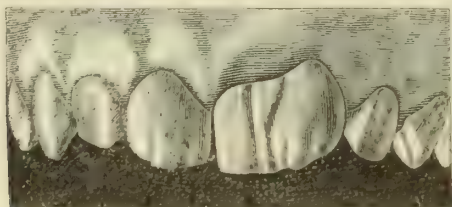
The patient, a man aged forty-five, had had for twenty years an indolent tumor of the size of a nut upon the left side of the maxilla. During the last four years the tumor opened several times, pus exuding from the fistula. Recently it had increased in size, this being concomitant with an infiltration of the cheek and gums. The patient had no carious teeth; one of the molars had not erupted on that side. An operation was performed which consisted in opening the antrum of Highmore. This was found to be filled with cheesy pus and the unerupted molar was found implanted in the orbital wall of the maxilla.

[*Wiener Zahnärztliche Monatsschrift*, Vienna, September, 1902.]

A CASE OF TOOTH-FUSION. BY W. WORM, GLEIWITZ.

The author states that cases of tooth-fusion belong to the class of dental abnormalities that are seldom met with in dental practice.

The examination of 20,000 school-children of Schleswig-Holstein (*Corresp.-bl. f. Zahn-ärzte*, 1899, No. 3), did not show a single case of tooth-fusion. The case he describes



is one among 3000 school-children of Gleiwitz whose teeth have been carefully examined by the author. The crown of the abnormal tooth measures $11\frac{1}{2}$ mm., and, as can be seen in the accompanying figure by the vertical band upon its labial surface, is composed of two fused teeth.

[*Revue Odontologique*, Paris, October, 1902.]

A CASE OF LINGUAL ADENOMA. BY DR. VIANNAY.

This report is interesting in view of the extreme scarcity of lingual adenoma. Professor Broca, in his treatise on Surgery, states that the glandular variety of tumors of the tongue is so rare that its existence becomes doubtful. It is in view of this that Dr. Vian-

may presents this report on the removal of a tumor from the left border of the tongue. The neoplasm was about the size of a large chestnut, of a polished appearance, and of a rose color. The histological examination by Professor Paviot showed that the tumor belonged to the glandular variety of neoplasms.

[*Archiv für Zahnheilkunde*, Berlin, September, 1902.]

A VOLUMINOUS SALIVARY CALCULUS IN THE SUBMAXILLARY GLAND. BY PROFESSOR DR. GEROTA, BUCHAREST, ROMANIA.

The essayist states that salivary deposits affecting the glandular tissues never attain a conspicuous volume, as their presence is easily recognized by the patient, because in a large majority of cases they are located in the ducts of glands, and in particular in Wharton's duct, and that therefore the case here reported presents an unusual degree of interest, inasmuch as the calculus was located in the center of the gland, and also because in spite of its concealed location a correct diagnosis was arrived at with the aid of the X rays.

This case is also interesting in view of the size and weight of the calculus, which measured 26 mm. in diameter and weighed 6 gm. The patient at the time of his examination by Professor Gerota stated that during the previous two years the right side of the mandible had been at intervals the seat of painful swellings, and that these phenomena, which were concomitant with inflammatory disturbances, lasted about ten days and disappeared without treatment. The patient, however, observed that in the meanwhile the tumor was gradually increasing in size. In view of the conditions present the disturbance was diagnosed as a tumor of the submaxillary gland, but its exact nature could not be ascertained at that time. It could not have been an acute submaxillitis, because of the absence of inflammatory phenomena.

In diagnosing the tumor, after having eliminated the possibility of an infectious adenitis and of a syphilitic or tuberculous lesion, the author came to the conclusion that it was not one of malignant character, basing this supposition on the fact that its evolution had been slow, that there had been absence of pain, that no break in the continuity of the tissues could be found, and further,

because of the small size of the growth. It could have been a mixed fibroma or a mixed enchondroma, but remembering the peculiar way in which the tumor had developed, with the occasional occurrence of painful swellings which would disappear without leaving the slightest trace of their existence, the presence of a peri-adenitis, and further taking into consideration the hardness felt in the center of the tumor, the author finally diagnosed the disturbance as an inflammation of the submaxillary gland, due to the presence of a salivary calculus; but notwithstanding the fact that he was almost positive as to the correctness of this diagnosis, he nevertheless decided to make an X-ray examination in order to verify it. The result of this examination was confirmatory; it became now an accepted fact that the disturbance was a "submaxillitis caused by salivary calculus lodged in the substance of the gland." An operation was consequently decided upon, and was performed after anesthetizing the structures involved with a cocain solution.

An incision, 5 cm. in length and parallel to the horizontal portion of the mandible was first made. After reaching the gland, cocain was injected into its structure. It was then sectioned in the middle, the sack inclosing the calculus was opened, and the calculus removed. Seven days after the operation the tissues had regained their normal condition.

[*Journal of the British Dental Association*, London, September 15, 1902.]

TWO ODONTOMES. BY W. H. DOLAMORE.

The author reports two cases of odontomes. The first was an instance of composite odontome removed from the lower jaw of a male patient aged twenty-two. It is stated that this odontome is among the largest recorded in this situation, weighing 24.5 gm. and measuring in length 4.2 cm., in depth 2.8 cm., in width 1.6 cm., and yet it is insignificant in size when compared with some odontomata removed from the maxilla.

About three years previous to the patient's consultation with Mr. Dolamore, on August 29, 1901, the first pain appeared. He thought that the root of a tooth was the cause of the trouble. There were also swellings that would appear and disappear. The location of the odontome is described by the author as follows: The molar and second premolar teeth were absent on the right side, the first premolar root remaining. A roughened, hard surface occupied about the situation of the second molar, being distinctly posterior to the normal position of the first molar. A pointed probe could be passed vertically downward at

the anterior surface of the tumor to a great depth. At the posterior margin of the exposed surface the probe passed in a slanting direction downward and backward. The margins of the gums were slightly inflamed and there was a slight amount of pus. The tumor was removed with an elevator, with the patient under the influence of nitrous oxid. Adherent to the tumor was a portion of a fibrous-like capsule. On examination this capsule and the overlying odontome showed at the outer and posterior portion the imprint of a molar tooth. This was found implanted in the wall of the "socket" of the odontome, and was removed by means of a root-forceps. The author states that the facility with which the tumor was removed was remarkable, and that, owing to the fortunate removal of a portion of the capsule, he is able to present the results of the microscopical examination of the pathological specimens by Mr. Hopewell-Smith.

The second case was that of a radicular odontome, which occurred in a girl aged fourteen. It occupied the position of the lower right lateral incisor, and was a flattened, enamel-covered, tooth-like structure with a second conical mass fused to its inner surface and ending below in a smooth, bulbous mass which was implanted in the jaw. The mass was disfiguring, and the space left on its removal would diminish, if not entirely close, by the approximation of the adjacent teeth. The odontome was therefore extracted. It weighed 2.7 gm.; the antero-posterior diameter measured 1.2 cm.; the lateral diameter 1.6 cm.; the vertical 1.9 cm.

The paper was followed by a fully illustrated microscopical report prepared by Mr. Hopewell-Smith.

[*L'Odontologie*, Paris, October 15, 1902.]

ARTIFICIAL LARYNXES. BY DR. CLAUDE MARTIN, LYONS, FRANCE.

The first complete resection of the larynx was performed by Billroth, and the first attempt to substitute this organ with an artificial appliance was made by Gussenbauer. The artificial larynx constructed by the latter was far from being perfect, but nevertheless, with the aid of this apparatus the patients were able to speak loudly and plainly.

Von Bruns improved the artificial larynx suggested by Gussenbauer, by making the laryngeal cannula of articulated segments adaptable to the movements of the larynx. Since Von Bruns undertook this line of work, many modifications have been devised, but they were rather complications than improvements. The larynxes constructed by Foulis, by Labbé, by Cadier, etc., did not present any

disadvantages over the one suggested by Gusenbauer, and it is in view of these unfavorable results that the author takes this opportunity to describe the artificial larynx which he has had to construct in order to substitute a natural organ which had to be resected because of a laryngeal obstruction of syphilitic nature. The appliance constructed by Dr. Martin is a complete success in the sense that the patient can speak loudly. He can also eat and drink with the appliance *in situ* and without the necessity of removing the phonating cannula or of closing up the pharyngeal piece. The first step after the surgical removal of the larynx consisted in the placing of a rubber tube of the same caliber as the natural organ in order to prevent the cicatricial retraction of the tissues. In this way it was possible to delay the placing of the permanent appliance until after the complete healing of the structures involved.

The artificial larynx devised by Dr. Martin is composed of the following parts: First, a tracheal cannula upon which is fixed the phonating apparatus by means of a ring through which the cannula is inserted. The author describes this piece, which is composed of three different parts, and summarizes as follows the advantages offered by his appliance. The patient can take deep inspirations through the mouth and nose. The current of air inspired passes through the metallic gauze and opens widely the rubber wings of the rectangular tube which carries the vibratory reed. The patient can eat and drink with the appliance in position and can also talk at the same time. During deglutition the solid substances are retained by the metallic gauze. The liquids pass through into the resonance chamber, but not upon the vibrating wings. By means of this arrangement the trachea is protected against the entrance of foreign bodies.

In a description of an artificial larynx, published on page 203 of the DENTAL COSMOS for February, 1902, Dr. Martin states that with that apparatus the voice is always of the same pitch, but that by some modification he hoped to render the voice less monotonous. In the present report the author sets forth the improvements which he anticipated at that time. The improvement in this apparatus consists in the fact that the patient can simultaneously talk and eat without fear of any accident, and can keep up a conversation for a long time. The only thing which the apparatus lacks to make it absolutely perfect is an arrangement by which the voice could be modified at the will of the patient in order to approach as much as possible the

character of the natural voice. Dr. Martin has already undertaken a series of experiments with this aim in view, and has had already such satisfactory results that he has full hopes of obtaining in the near future an automatic apparatus which will give to the voice a natural degree of softness and harmony.

In operations of this nature it becomes necessary to prevent the stenosis which commonly follows, by the insertion, immediately after the operation, of an apparatus which will keep the tissues in their normal relations during the process of cicatrization.

[*International Dental Journal*, Philadelphia, November, 1902.]

THE VALUE OF CATAPHORESIS. BY DR. LOUIS JACK, PHILADELPHIA, PA.

Before opening the subject in its practical relations, the author gives an historical statement concerning the electrical diffusion of medicaments.

The first investigator in this direction was Dr. B. W. Richardson, of London, who published two articles on "Voltaic Narcotism," in 1859. These experiments were conducted with aconite in combination with chloroform. With the aid of this combination, he performed a series of successful operations, among them the extraction of teeth. Richardson met with intense opposition on the part of his medical *confrères*. He subsequently abandoned further experimentation, the development of general anesthesia probably removing the incentive for further pursuit.

The subject remained *in statu quo* until it was revived by Wagner, in 1886. Reynolds commenced to use cocaine in connection with cataphoresis in 1887. Peterson began a series of interesting and conclusive experiments in 1888. In its application to dentistry, the first published paper was by B. F. McGrath, in 1888, and Westlake, in 1892, read a paper before the New York State Dental Society, in which he claimed successful results. In 1895 Dr. Gillett presented before the American Dental Association an article containing explicit directions with relation to satisfactory experiments and description of operations; this enlisted immediate and general attention to the subject, and it must be held that by his methods this method of treatment was placed on a reliable basis.

The experiments of Dr. Jack began in 1896. He followed the methods recommended by Dr. Gillett, but with a different apparatus. Since that time he has used cataphoresis in 260

cases, mostly in acute conditions. The results have been satisfactory, this being due, according to the author, to the apparatus he employs. It is stated that in cases in which the sensitivity of the dentin can be relieved with carbolic acid in combination with oil of cloves or caustic potash, or desiccation by heated air, the use of cataphoresis is not indicated. There are, however, many instances when sensitivity is so extreme that zinc chlorid or general anesthesia is required in order to be able to excavate and shape the cavity.

Zinc chlorid, Dr. Jack states, is only applicable to shallow cavities, and should not be applied to the front teeth under any circumstances. For this variety of cases cataphoresis is the medium indicated to relieve the hypersensitivity of the dentin. After complete anesthesia by cocain cataphoresis, it becomes possible to excavate and prepare the cavity without causing any undue pain to the patient. The author refers to the effect of subjecting persons of high nervous irritability to acute dental pain, stating that it produces shock not apparent at the moment, but manifested afterward by a general depression. It must also be taken into consideration that a large proportion of operations are inefficiently carried out because of the inability of the patient to endure the proper extension of the tissues in order to secure sufficient retention.

The essayist then states that objection has frequently been made because of the time required to secure anesthesia in this manner, but that the loss is more apparent than real, for, in cases in which the sensitivity of the dentin cannot be relieved, temporary fillings have to be inserted, thus indefinitely deferring permanent operations.

[*Dental Register*, Ann Arbor, November 15, 1902.]

NITROUS OXID GAS. BY DR. S. STRAITH.

After discussing the innocuousness of nitrous oxid, the author takes up the question of the use of this gas in combination with other agents. He says that nitrous oxid is given because of its almost absolute safety, and that when it is mixed with other anesthetics its safety is diminished and danger is introduced in proportion to the amount and quality of the agent used.

He next takes up the administration of nitrous oxid in combination with oxygen, and it is in the paragraph in which this matter is discussed that we find several statements to the accuracy of which we could not testify; for instance, Dr. Straith states that Dr. Hewitt has resurrected Paul Bert's theory of

mixtures of certain amounts of oxygen with nitrous oxid, but that unfortunately for Dr. Hewitt, ninety-nine per cent. of the dentists who use nitrous oxid at all, use it without the admixture of oxygen.

We would like to know by what statistical method Dr. Straith has reached this definite conclusion. We have reason to believe that the proportion of dentists who use the nitrous oxid and oxygen combination is greater than one per cent., and further, we know from reports published in different journals and at different intervals that the actual proportion is gradually increasing.

It is unnecessary to enter into a discussion to show the advantages of the mixed method over the method of administering nitrous oxid without the admixture of oxygen. If Dr. Straith does not regard cyanosis as a disagreeable and dangerous symptom, then and only then can he claim that the combined method does not present any advantages over the simple method of nitrous oxid administration.

The reviewer has had the opportunity of observing many cases of anesthesia with nitrous oxid and oxygen, and is therefore warranted in stating that, as far as his experience goes, the administration of nitrous oxid in combination with oxygen presents many advantages over the administration of nitrous oxid alone. By combining oxygen with nitrous oxid all danger of asphyxia is eliminated, the anesthesia can be prolonged for many minutes without any danger to the patient, and the return of consciousness is not accompanied by any of the disagreeable symptoms which generally follow the administration of nitrous oxid alone; further, the feeling of suffocation which the patient experiences when nitrous oxid is administered alone is completely eliminated when administered in combination with oxygen. In his arguments in defense of the exclusion of air or oxygen, the author has not taken into consideration the comfort of the patient,—a factor which the administrator should not lose sight of when giving an anesthetic.

With reference to the after-effects of nitrous oxid anesthesia, the author quotes Dr. Buxton, who states that when nausea or vomiting follows the administration of nitrous oxid, it is due to the swallowing of gas which would cause a very sensitive stomach to react.

The same Dr. Buxton, in a paper published in the *DENTAL COSMOS* for September, 1901, after studying the physiological effect of nitrous oxid, takes up the question of mixed administration with oxygen, expressing him-

self as follows: "Having then substantiated that nitrous oxid was a specific and genuine anesthetic, it became a necessity to obtain some method whereby this introduction into the air passages should take place without necessitating the cutting off of the oxygen supply." From this paragraph it can be seen that Dr. Buxton considers advisable the combination of oxygen with nitrous oxid.

Dr. Straith then gives a description of his method of making nitrous oxid gas, and devotes the rest of his paper to further discussing the advisability of administering nitrous oxid without admixing it with air or oxygen.

[*Lancet*, London, October, 18, 1902.]

NASAL OBSTRUCTION AND DEFORMITIES OF THE UPPER JAW, TEETH, AND PALATE. BY MAYO COLLIER, M.S. LOND., F.R.C.S. ENG.

The author shows, by means of illustrations, the peculiar deformity of the upper jaw so commonly associated with obstructed nasal respiration. He says that various explanations have been given of the irregular and unsymmetrical conditions of the jaw, teeth, and palate, but that none is altogether clear or completely satisfactory.

The object of this communication is to show, in the first place, that in impeded nasal respiration there is a difference in the pressure on the outside and the inside of the walls of the upper jaw, and that this difference in pressure, however small, is capable, in the young and growing skull, of altering and affecting the curves of the upper jaw and the shape of the face and palate; also that in young animals whose nasal cavity or cavities have been obstructed for the purpose of observation, a profound alteration takes place in the development of the upper jaw and a marked alteration in the curves of the alveolar arch and position and height of the palate.

Regarding the prevalent idea that these cases are "hereditary," the author says that he has photographs of children that he has personally seen and known, and who were born with beautiful, regular faces and symmetrical dental arches, who became in after life the subjects of these deformities. Mr. Collier states that to say that these cases are hereditary is not an explanation, as the term hereditary is as much an unknown quantity as the algebraic formula x . The same set of circumstances may surround the offspring in the early years of life that surround the parent, and produce a similar effect, and yet in no sense be properly attributed to an hereditary tendency.

An explanation that approaches nearest the

truth is the one associated with nasal obstruction and mouth-breathing. Here, undoubtedly, a stream of air passes the palate and tongue to find its way to the lungs. The lower jaw is constantly separated and the masseter muscles are constantly put on the stretch. It is incorrect, the author says, to contend that the alveolar arch is dragged down and approximated by the downward pull of the masseter muscles, and that the palate is pushed up and elevated by the impact of the stream of air upon it. The masseter muscle has no attachment to the alveolar arch, and could only pull down the malar bone and the zygoma, and that consequently the action of the masseter is out of court as an explanation. The buccinator muscle has also been put forward as an active agent in these deformities; but this cannot be the case, inasmuch as its line of contraction is at right angles to the line of action required in order to produce the effect claimed.

In mouth-breathing the contention is good that the stream of air passing into the mouth is the cause of the deformity of the palate, but the method of production is not by impact on the palate of the stream of moving air. The effect is produced by this very same stream of air on its way to the larynx and lungs partly extracting the contents of the nasal chambers and so producing an increased pressure from without on all the walls of the nasal box. The increased pressure not only pushes up and elevates the hard and soft palates, but also squeezes and approximates the halves of the upper jaw, and so prevents its proper development and expansion, and produces the various deformities and irregularities indicated.

In explanation of this theory, it is stated that any stream of air, passing however slowly and softly over any opening leading into any chamber whose contents are air or gas, abstracts part of the contents and consequently lessens the tension of that gas or air. This law of pneumatics applies to all atoms in the state of mobility. The actual proof that the tension of the air in the nasal chambers is lessened during each oral inspiration can easily be obtained, and should be a complete answer to any objection to the accuracy of the contention. If a manometer be connected with the nose, and fit accurately during each oral inspiration, the mercury will ascend in the proximal limb. A more absolute proof cannot be offered. One can also actually see the effect of the difference in tension of the air-contents by observing the interior of the nose through a Seigle's aspirator. On inspiration the mucous membrane becomes redder, and on expiration paler, due to the increased

or the decreased extra-vascular pressure. He refers to the experiments of Professor Ziem of Dantzig, who has proved by direct experiment on animals that every obstruction to the nose, when acting for some considerable time, exerts widespread consequences on the development of the skull in young animals in which the nostrils, one or both, are completely blocked up for a long time. The experiments

of Professor Ziem are again corroborated by the results obtained in these cases by restoring the normal nasal respiration. If the deformity is not too marked, and the age of the patient is below that where complete ossification has taken place, much improvement in the size, shape, and symmetry of the upper jaw can be effected by simply restoring the normal caliber of the nasal passages.

PERISCOPE.

A Valuable Sign of Hereditary Syphilis.—A. Brunet (*Pediatrics*), claims that erosion of the lower first molar, in a patient whose other teeth are healthy, is a pathognomonic sign of hereditary syphilis. The first molar of the second dentition is the only tooth the ossification of which begins *in utero*.—*Denver Med. Times*.

Acids which Bring About Erosion of Enamel.—Enamel suffers from chemical solution through the action of acids formed in the mouth during fermentative processes, and probably by morbid secretions of the glands, also through the action of acids present in foods or taken as medicinal agents.—W. H. REABEN, *Dental Headlight*.

Morphin to Lessen Shock following Hemorrhage, Burns, etc.—After severe hemorrhage, burns, or lacerated wounds, the prompt use of moderate doses of morphin is of extreme value in diminishing pain and lessening the shock. By quieting the restlessness and slowing the heart's action it is also apt to lessen hemorrhage.—*Internat. Journ. of Surgery*.

Novel Remedy for Neuralgia.—Naegeli announces that he has frequently caused almost immediate cessation of cephalalgia and facial neuralgia, by simply elevating the larynx, holding it well upward for sixty or seventy seconds. This frequently requires to be repeated several times, but quite as frequently one single attempt will prove successful.—*Public Health Journal*.

Disinfection.—Of disinfectants that are efficacious, innocuous, automatic, and inexpensive, the best is formic aldehyd. It forms an odorless compound with ammonia, which becomes useful, after disinfection, for removing the smell. It also makes gelatin insoluble, forming a hard, transparent mass. It is

antiseptic, diffusible, and penetrating.—ALFRED MARTINET, *La Presse Médicale*.

Successful Bridges.—Experience has taught us that the most successful bridges have been small ones which are attached to strong, healthy roots or teeth. Bridges of ten, twelve, or fourteen teeth are seldom or ever admissible under any circumstances, unless the abutments are placed so as to equalize the pressure caused by the force of mastication.—F. E. LOGAN, *Dental Headlight*.

Polishing of Crowns Without Spoiling their Shape.—Fill about half full of softened sealing-wax, insert a stick for a handle, and allow to cool. The crown can now be polished without stretching the neck. Remove the crown by holding it in a flame, allowing it to drop off. Burn wax in crown by holding in the flame, and afterward drop in a pickle.—O. H. SIMPSON, *Dental Summary*.

Ordering of Teeth by Mail.—Every dentist who orders teeth by mail should have a catalogue of teeth. After the size and shape have been determined, select the teeth that correspond to the measurements. It is often necessary to order the incisors and canines from one mold and the bicuspid and molars from another. When writing to the dealer, the dentist should give the mold number, whose catalogue used, the color of teeth, and whose shade guide used.—J. Q. BYRAM, *Dental Review*.

Therapeutic Application of X Rays.—A case of facial carcinoma and epithelioma and one of lupus were benefited by the use of X rays. The rays relieve pain and disagreeable discharge, and, in spite of the disadvantages of time and great care required to carry out the treatment, and the cost of apparatus, these disadvantages are many times overbalanced by the results.—E. D. BONDURANT, *New York Med. Journal*.

Gutta-Percha a Saver of Teeth.—Gutta-percha is not the easiest material to work successfully, but only a little care is needed in heating, packing, and trimming, and it will do its own work faithfully. It may become a little furry, it may discolor a little and it may leak; but as a saver of teeth in young, delicate children, I have seen it do service that prompts me to speak of it with the greatest enthusiasm.—W. SEPTIMUS HINDER, *Australian Dental Journal*.

Severe Burns with Amyl Nitrite.—Edward A. Shumway (*Philadelphia Med. Journal*, October 11th) presents a case of severe burn of the eye and face by amyl nitrite which indicates that, while the administration of amyl nitrite is ordinarily safe, it is not entirely free from danger, owing to the fact that this medicament, on long keeping in the light, and with access of air, decomposes, with the formation of nitrous and nitric acids.—*New York Med. Journal*.

Selection of Artificial Teeth.—The principal points to consider in selecting artificial teeth are size, shape, bite, ridge lap, and color. Unless there is an harmonious relation between the different parts there will be a lack of grace and beauty. Artificial dentures may be artistically constructed, but they do not serve from the esthetic point of view if there is a lack of correlation of the parts, which is so necessary to produce beauty.—J. Q. BYRAM, *Dental Review*.

How to Succeed in the Practice of Orthodontia.—Orthodontia is a specialty, not only in training, but essentially in practice. Whoever would succeed in its practice must love and cultivate art, especially that highest type of art, the human face. He must enthusiastically love his work and strive for the highest ideals. Then will he be willing to work to overcome difficulties, and will have the courage of his convictions and succeed where others would only fail disastrously.—E. H. ANGLE.

Cocain in Saturated Solution a Daily Necessity in Dental Practice.—The saturated solution of cocain has now become a daily necessity in my practice, as I use it always in fitting bands for crowns, adjusting separators, inserting wedges, ligating the rubber dam (when this procedure is unavoidable), and in excising hypertrophied gum tissue.—E. R. CARPENTER, *Dental Review*.

[A saturated cocain solution is a valuable agent for the immediate and painless extirpation of pulps.—Ed.]

Encouragement of Young Graduates by Older Practitioners.—Association stimulates companionship, ambition, and development of mind. There should be special encouragement from our senior members to the young graduates to join dental societies. Few of us, as young men, walk into the lucrative practice that we had sometimes anticipated before leaving college. It is here that they should come to seek encouragement from those who have enjoyed fair success.—BURT J. MARSHALL, *Dental Headlight*.

Eliminating Function of the Skin.—The skin being one of the principal eliminating organs of the body in health, its office being to remove large quantities of water, and through this menstruum quantities of effete and poisonous material, whenever its function is impaired by disease we have these poisons manifesting themselves in eruptions and blotches, ulcers, carbuncles, boils, and various blemishes, until the hair falls, the nails become defective and brittle, the teeth become loose, and pyorrhea alveolaris sets in.—L. G. NOEL, *Dental Headlight*.

Characteristic Symptoms of Secondary Syphilis.—One of the most characteristic symptoms of secondary syphilis is dryness of the hair and its rapid falling during the progress of the disease. This is evidently due to a disturbance of its nutrition by the specific poison with which the skin is charged. In inherited syphilis the teeth are faulty in their development, presenting the shortened, stunted crowns, with notched and ridged enamel, described by Hutchinson, and therefore often called "Hutchinson's syphilitic teeth."—L. G. NOEL, *Dental Headlight*.

Effects of Imagination.—An X-ray examination at a Chicago laboratory has disclosed the fact that J. G. Robertson, at Cooksville, Wis., did not swallow his "false teeth," as he had supposed. This discovery has greatly relieved Mr. Robertson's mind, and, incidentally, an acute stomach trouble from which he has suffered since the disappearance of his teeth. Robertson lost his teeth while asleep, and the belief that he had swallowed them so preyed upon him that he made the trip to Chicago to have them removed if they proved to be in his stomach.—*Dental Summary*.

To Produce Spring Temper in Swiss Broaches.—To draw Swiss broaches to a spring temper they should be placed on a steel, iron, or brass plate, one-eighth of an inch thick and about three inches square.

This should be held by pliers or forceps over a spirit lamp, or Bunsen burner, and be kept continually moving over it, so as to keep the plate heated as uniformly as possible. The broaches should be watched very carefully, and when they become a pigeon-blue color they should be dropped into cold water.—*Internat. Dental Journal*.

Artistic Modifications of Artificial Teeth by Dentists.—I think that the dental profession should not expect the manufacturer to supply them with these artistic requirements, or, in other words, supply the dentist with teeth with which he may be able to reproduce and simulate nature in its various individual characteristics. That lies purely within the province of the artistic dentist, and not in that of the manufacturer or the artisan or the laboratory man. Only by doing it ourselves can we become artistic in the practice of prosthetic dentistry.—L. H. ARNOLD, *Dental Review*.

Chromic Oxid in Inflammations of the Buccal Mucous Membrane.—Jarre (*St. Louis Medical Review*) announces that local applications of chromic oxid promptly cure all inflammatory and ulcerative lesions of the buccal mucous membrane. It should be applied in a concentrated solution, and rinsed off at once to restrict its action upon the superficial tissues.—*Monthly Cyclopædia of Practical Medicine*.

[Silver nitrate, as a local application in the proportion of 60 grains to 1 ounce of distilled water, gives excellent results in the treatment of ulcerative conditions of the oral mucous membrane.—Ed.]

Deflection of the Nasal Septum.—Dr. Nelson M. Black, of Milwaukee, in a paper entitled "One of the Etiological Factors in the Production of Deflected and Deformed Nasal Septum, and the Methods for its Relief" (*Amer. Med.*, February 15, 1902), calls attention particularly to some cases due primarily to a high-arched palate the result of a deformity of the upper jaw, and the satisfactory results obtained by having the lateral diameter of the jaw widened so as to relieve the strain of the septum before performing any intranasal operation for its correction.—*Amer. Journ. of the Med. Sciences*.

Valuable Properties of Silver Nitrate.—The metallic salts stand among our most useful antiseptics and germicides. Should science succeed in relieving the nitrate of silver of its staining qualities, we should have

but few better. While it is a powerful coagulant of albumin, its penetrating powers are also remarkable. I have found nothing better for the inflamed tissue about an impacted third molar than a few shreds of cotton saturated with a strong solution of nitrate of silver and placed beneath the overlapping soft tissues after they have been washed out with pyrozone.—DR. WALLACE, *Dental Era*.

Value of a Royal Tooth.—At Montreal the Princess of Wales dropped a glove, which was picked up by a child. Hearing that £50 had been offered and refused for the glove, the Princess sent the child a pair, with a note. The lot fetched £110. And at Adelaide an offer of £250 was made for the tooth which, before its extraction, had caused the royal owner much suffering upon the voyage. If only our royal personages would consent to have their teeth drawn regularly, and throw away a glove now and again, the income tax might be abolished. The national finances would for once benefit by a hand-to-mouth policy.—*Brit. Journ. of Dental Science*.

Hemorrhage Following Pulp-Extirpation.—If the pulp be removed bodily and severed at the apex of the root, there will not be much hemorrhage; but if torn into shreds and removed piecemeal, there is usually quite profuse hemorrhage; and this I consider the objectionable feature of the surgical destruction of the pulp. In such cases I do not advocate the immediate filling of the canals, because of the time required to completely control the hemorrhage, and the liability of leaving portions of the pulp in the canal.—U. D. BILLMEYER, *Dental Headlight*.

[Adrenalin chlorid may be suggested for the prompt arrest of hemorrhage incident to pulp-extirpation.—Ed.]

"Good enough" will Never Do.—In using any form of gold, if we take for our motto that good enough will never do, but that each succeeding step in building up the character of our professional attainments must be a step in advance, more perfect adaptation, a better conservation of the energy of both patient and dentist, a more thorough understanding of the materials that we use and of the functions they are to perform in the economy of the mouth, with a determination to employ thoroughness in every operation, we shall from day to day take a step higher in the attainment of a more perfect professionalism.—FRANK O. HETRICK, *Western Dental Journal*.

Cysts Formed as a Sequel of Alveolar Abscess Not True Cysts.—In certain cases the pus, instead of causing an absorption of the bone, forming the so-called "absorption area," produces a "bulging" of the external plate. Because of some *locus majoris resistentiæ*, the pus is reabsorbed, and the acute process, if such existed, passes away. There is a sterile exudate, plastic in character, poured out, which fills the newly formed cavity; this after a time becomes organized into true fibrous tissue. The tissue first formed seems to be in the outer zone, with a middle zone of plastic exudate partly organized, and an inner zone of substance resembling mucus.—FREDERICK B. MOOREHEAD, *Dental Era*.

Antrum Irrigation with Hydrogen Dioxid.—We will make the statement, which to some may seem immoderate, that hydrogen dioxid in full strength may in some cases be injected into the diseased antrum by an experienced operator,—though this is not necessary nor advisable as a rule; but I wish to emphasize the need of great thoroughness in the syringing out of the antrum with the hydrogen dioxid solution, for this is the chief factor of our success in curing a diseased antrum in the shortest time possible. This wash should be injected into the antrum five or six times or more at each treatment, or until the effervescence escaping exhibits the whiteness that indicates purity and cleanliness.—H. A. CROSS, *Dental Review*.

Caries of Deciduous Teeth treated with Silver Salts.—Decay in deciduous teeth and very superficial caries are often checked by the application of some one of the silver salts, usually the nitrate. It has, however, the disadvantage of being very caustic and of staining any organic matter it touches. Several new silver derivatives have lately been introduced which should be preferred on account of their not possessing these faults unless used to excess, while they have decided germicidal, antiseptic, and deodorant properties, and are destructive to all forms of bacterial life. There are several of these new preparations, but three in particular, viz, argonin, protargol, and largin, seem to be the best.—F. E. CROSBY, *Dental Summary*.

How to Remove Rust from Polished Steel.—To remove rust from polished steel, potassium cyanid is excellent. Soak, if possible, the instrument to be cleansed in a solution of potassium cyanid in the proportion of one ounce of cyanid to four ounces of water. Allow this to act till all loose rust is removed,

and then polish with cyanid soap. The latter is made as follows: Potassium cyanid, precipitated chalk, white Castile soap. Make a saturated solution of the cyanid and add chalk sufficient to make a creamy paste. Add the soap cut in fine shavings, and thoroughly incorporate in a mortar. When the mixture is stiff cease to add the soap. It should be remembered that potassium cyanid is a virulent poison.—*Power and Transmission*.

How to Impress Children with the Importance of Caring for Their Teeth.—I have a great many children who come to see me about holiday time or just when they are about to go back to school, and I find it very difficult to impress upon these little urchins the importance of personal cleanliness in the care of the teeth. They come in with more or less *débris* about the teeth; the teeth are stained, and incidentally there is a bad condition of the mouth. The way I manage these little patients is this: I clean a central incisor for them, as nicely as I can, and then, taking that as a model, I tell them to clean the others themselves. It is one of the best dodges I have hit upon, and when they come in the next holiday I find their teeth and mouth in a much better condition.—WILLIAM MITCHELL, *Dental Review*.

Mixing of Cements.—It is a known fact that one chemical for which another has an affinity will take up an exact quantity,—no more and no less under any circumstances. In mixing cement composed of zinc oxid and phosphoric acid, if the "mix" be too thin, there is an excess of phosphoric acid, and this acid will wash out. If the mix is too thick, there will be an excess of powder, which simply remains as inert material, causing the plug to crumble. The only possible way to overcome these defects would be to carefully weigh out the exact quantities, a thing the ordinary practitioner has neither the means nor the time to do. It is my belief that, without exception, those fillings which have proved durable were accidentally mixed in the exact proportion necessary to produce a perfect chemical compound.—A. A. WILCOX, *Dominion Dental Journal*.

Every Dentist May Practice Orthodontia.—It is true that in the larger cities orthodontia is becoming a specialty, and men are devoting their whole time to this work. But the vast majority of the people cannot avail themselves of the opportunities offered by these specialists, and consequently will, and should, look to their resident dentist for re-

lief in these cases. It is "up to" you, and it remains to be seen whether you will henceforth allow your little friends and patients to grow up with these cases uncorrected, oftentimes presenting a really disgusting appearance. They are nothing more nor less than monuments to your unfulfilled obligations and duties. Facial expression is very important, but not any more so than distinct enunciation and good occlusion and mastication. The manufactured appliances are numerous, adequate, and simple, and any dentist with a little study and the exercise of common sense can secure results beyond his expectations.—THOS. P. WILLIAMS, *Texas Dental Journal*.

Art in Prosthesis.—The beauty of all artificial work lies in the ability of the artist to conceal his art, and nowhere is this more applicable than in crown and bridge work. Do you think that bands, jacket crowns, and gold crowns in the front of a patient's mouth assist in disguising such art? I claim that they are very unsightly, and decidedly inartistic. Suffice it to say that if dentistry is to become universally acknowledged as a profession embracing a field of dignity and scientific pursuit, and if crown and bridge work is ever to be accorded that recognition as an art to which its scope and possibilities entitle it, the practice of placing bands and all-gold crowns on any of the six anterior teeth or within the range of vision, violates every principle of art, must be degrading, and cannot be too vigorously condemned; for I care not how well the work may have been performed from the mechanical standpoint, it is an offense to art and refinement.—F. E. LOGAN, *Dental Headlight*.

Visual Defects due to Drugs.—In the *Medical Record* for May is the report of a paper read by Dr. de Schweinitz, of Philadelphia, to the Medical Society of the County of New York, "On Defects of Vision Resulting from Certain Drugs, and the Treatment of These Conditions." Quinin amblyopia was one of the most interesting of those diseases; it might appear under one of several forms,—as a temporary quinin blindness, as an acute quinin blindness, or as a permanent quinin blindness.

The first form of quinin amblyopia was especially common in nervous women. The second followed a single large dose of quinin, or a succession of large doses on successive days. The chief characteristic was sudden and complete loss of sight. There was almost always marked pallor of the disk and

contraction of the visual field. It has been shown that in animals an excessive dose of quinin was followed by direct degeneration of the retinal ganglion cells. Treatment consisted in stopping the quinin and giving strychnin and amyl nitrite.

Iodoform amblyopia occasionally followed the absorption of the drug from surgical dressing. It was rarely permanent.

Acute alcohol amblyopia had been known to follow ingestion of two drams of methyl alcohol. In some cases the adulteration of ginger and other substances with methyl alcohol had produced the disease. Ordinary alcohol was much less fatal, and was usually combined in its effect with tobacco. It was difficult in some cases to separate the scotoma due to tobacco and alcohol from a similar defect found in disseminated sclerosis.

Lead produced amblyopia by bringing on an inflammation of the optic nerve and later of the retina. Degeneration affecting both the retina and the brain was found. The source of the poisoning was often obscure. Seamstresses might suffer from biting thread coated with lead compounds. Workers in rubber were affected by amblyopia due to the inhalation of vapors of carbon bisulfid. As a rule, some time was necessary before the disease showed itself.—*Treatment*.

•Crowning Anterior Teeth when Broken Below the Alveolar Process.—With such a case I proceed by carefully detaching the gum from the loose piece of root with the lancet, and in removing the loose piece being careful not to deface the piece or slit the gum. I then prepare the remaining root by removing the cement and deepening the canal; I then pack the canal and socket with some material to keep the gum from closing. The root being thus prepared, I proceed to make the crown by spreading a little plaster on a tablet, in which I imbed the gum surface of the piece of root removed, leaving the fractured surface and end exposed above the plaster. I now place the small end of an open thimble around the piece of root, and into this I pour Melotte's fusible metal, just as it is becoming mushy. This makes one die; and into this die I drive a large buckshot for the other. Between these dies I swage a thin piece of platinum plate; this gives me a platinum cup. I flow this cup full of 22-karat or 24-karat gold, trim and dress off the lap edges of platinum, and I have the piece of root duplicated in metal. I now place the duplicate in place in the socket from which the natural piece of root has been taken, and

take a measure, make, and fit a band. With this duplicate and band in place, I take an impression of the end of the root with whatever material that suggests itself as most suited. Into this impression I assemble the band and duplicate in their proper places, and invest and solder the band and duplicate together with a high-karat solder. I then place the band and duplicate in place on the root and grind down the front as much as the case requires, now using the band and duplicate as a band, finish the crown as I would a Richmond crown. Set with cement, and when it is pressed home the metal duplicate will fit its place in the root like a well-fitting inlay, cutting off the cement to a fine line.

When the surplus cement is removed, there will be no rough surface, open joint, or crack against and under the gum. There will be no recession, but the gum will remain as plump and healthy-looking as ever, over the polished surface of gold, and you have a crown equal to a banded Richmond crown.—H. B. HARRELL, *Texas Dental Journal*.

Root-canal Cleansing: Problems and Methods.—The important step in the treatment of putrescent root-canals which consists in the careful removal of pulp-débris previous to the application of germicides, demands an unusual degree of care and skill. Not only is it a difficult operation, but it is also one the results of which are doubtful after all, inasmuch as the field of operation is completely concealed from the eyes of the operator, and it is questionable whether in even one-half of the cases treated the contents of the canals are completely removed. The effects which may result from the filling of root-canals from which it has not been possible to take out all the organic contents because of the tortuous conformation of the root may be of such a serious nature as to demand the extraction of the tooth. Many suggestions have been offered to obviate the necessity of extracting all the filaments of pulp-tissue from tortuous canals, and while undoubtedly the method of introducing mummifying preparations into the pulp-chamber with the view of tannifying the organic elements of the pulp has given in some cases satisfactory results, yet the uncertainty of this procedure has been and will always be a barrier to the generalization of the method. All pulps cannot be tannified, inasmuch as in some cases the intensity of the infection may be such as to bring about the disorganization of the pulp-constituents long before the mummifying process sets in, and the consequences would then be just as detrimental and the

suffering incidental to pericemental infection just as acute.

Eliminating for the foregoing reasons the mummifying procedure as the course to be followed in cases of tortuous putrescent canals, we are still confronted with the problem, How should the contents of the tortuous canal be treated in order to be able to fill it with a reasonable degree of assurance that the operation will not be followed by detrimental effects?

We have implied that a complete removal of pulp-remnants should be effected before sealing the canals with a proper and permanent filling material, and we now add that while this is an imperative step in the operation here discussed whenever there is the slightest probability that the remains in the tortuous canal are the seat of infective processes; but, if by means of suitable and powerful medication it is possible to place the canals in such a condition as to preclude the development of bacteria, there could be no scientific reason why the canal should not be filled notwithstanding the presence of the now aseptic débris.

Two methods may be employed to bring about this end. The first consists in the application of the following preparation:

R—Formalin, ʒ x;
Oil of geranium, ʒj. M.

Sig.—Apply on cotton and leave in canal for twenty-four hours.

Formalin is valuable in this case because it expands at ordinary temperature, and goes beyond the apex, bringing about sterilization of the canal and of the periapical region.

The second method which may be suggested, and which in essence consists in the carbonization of the canal contents, offers over the previous method several palpable advantages. The operation is rapidly performed and the result is likely to be more complete. To carry out this suggestion it becomes necessary to use a special electro- or thermo-cautery, and as far as the writer is aware there is not at present in the market any device which would answer the purpose even approximately. An appliance for this purpose must be carefully constructed, and the needle, which can be made of platinum, silver, or copper, must be thin and be so tempered that it will go through the most tortuous canal without breaking. If in the treatment of canals which have been the seat of putrescent conditions the operator succeeds in thoroughly carbonizing their contents, he can fill them without the slightest shadow of doubt that the result will be permanent and satisfactory.—J. E.

HINTS, QUERIES, AND COMMENTS.

AN ABSCESSSED ALVEOLUS.

A GENTLEMAN whose age, I should judge, was thirty-five—came to me complaining of sharp pains in the temporal region. He told me that ten days previously he had had a tooth extracted which for many years had given him much trouble, on and off. On looking I found it had been a lower right second molar; the alveolus was nearly filled with pus, the bottom of which was cheesy in consistence. I cleaned it out, thoroughly scraped its walls and treated it regularly with antiseptics and counter-irritants in order to bring about a healthy circulation. I must not neglect mentioning that the patient had tuberculosis, which had a great deal to do in complicating the treatment, which I kept up for several days (twelve, I believe) with no perceptible results.

I then cauterized the affected area, and in fact did everything that seemed logical. As the result the patient informed me that he was somewhat better, but I realized too well that the improvement was only temporary in its nature, as it was clear that conditions could

never progress while such a cesspool existed. The pus had bored down into the infundibular proper, making the alveolus about one-fourth deeper than it was originally.

In view of these conditions and in order to establish a drainage, I performed the operation herewith described:

Having sterilized the field of operation as far as it was possible, I lanced the thin layer of mucous membrane on the lingual surface of the mandible at a point corresponding to the bottom of the alveolus; next, with right angle drilled in an upward direction so as to meet the abscessed alveolus at its lowest point and thus have the artificial opening self-draining; washed it out thoroughly with pyrozone, and after stopping the natural opening forced it through the artificial. This treatment was regularly continued for a short time. The inflammation soon subsided, and at the time of writing this report, over a month since the operation took place, the diseased region has regained its normal condition.—WALTER E. SCHOTT, D.D.S., Los Angeles, Cal.

SOCIETY NOTES AND ANNOUNCEMENTS.

NEW YORK ODONTOLOGICAL SOCIETY.

THE thirty-sixth anniversary of the New York Odontological Society will be held at the Academy of Medicine, 17 West Forty-third street, New York city, Tuesday, January 20, 1903.

For the afternoon session, beginning at two o'clock, an interesting series of clinics and demonstrations has been arranged.

In the evening at eight o'clock, Dr. Edward C. Kirk, of Philadelphia, will read a paper entitled "The Structural Characteristics of Calcified Dental Tissues as Related to the Question of So-called 'Hard' and 'Soft' Teeth," bringing out some new matter on this important subject, the discussion of which will

be made interesting by the presence of many men of prominence.

W. D. TRACY, *Ch'man Ex. Com.*

ODONTOGRAPHIC SOCIETY OF CHICAGO.

THE Odontographic Society of Chicago will hold its fifteenth annual meeting February 16 and 17, 1902.

It is the aim to make this a most memorable event in every particular. Papers have been secured from some of the leading men in dentistry, and the subjects selected for discussion are those of the greatest interest to the profession to-day. Two half-days will be devoted to clinics, and every operation of importance will be performed. The exhibitors will be present in full force with all the latest

appliances and inventions. Chicago extends a cordial welcome to the profession from every quarter of the globe to attend this meeting.

C. N. JOHNSON, *Pres.*,

F. H. ZINN, *Sec'y.*

NEW YORK STATE DENTAL SOCIETY.

THE thirty-fifth annual meeting of the New York State Dental Society will be held at Albany, N. Y., Wednesday and Thursday, May 13 and 14, 1903.

W. A. WHITE, *Sec'y.*,

Phelps, N. Y.

ARKANSAS BOARD OF DENTAL EXAMINERS.

THE Arkansas Board of Dental Examiners met in the city of Little Rock, Ark., December, 1902, at which meeting the following resolution was adopted:

"Resolved, That hereafter no certificate of qualification to practice dentistry shall be issued to any applicant, whether possessed of a diploma or not, except upon thorough examination."

J. M. FLENNIKEN, *Pres.*,

W. H. MARSHALL, *Sec'y.*

NEW HAVEN DENTAL CLUB.

THE fifth annual meeting of the New Haven Dental Club was held Tuesday evening, December 9, 1902. President Dr. E. S. Gaylord called the meeting to order. The following officers were elected for the ensuing year: W. H. Metcalf, president; W. S. Horton, vice-president; D. W. Johnston, secretary; R. M. Gaylord, treasurer. Executive Committee—E. S. Gaylord (chairman), H. S. Bascum, F. W. Brown. Finance Committee—Isaac Lyon (chairman), H. A. Spang, A. F. Slater.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE fifth annual meeting of the Southern California Dental Association was held at Riverside, Cal., October 20 and 21, 1902. The following officers were elected: J. W. White, Los Angeles, president; C. S. Lane, Santa Barbara, first vice-president; J. W. Neblett, Riverside, second vice-president; A. T. Covert, Long Beach, treasurer; Lewis E. Ford, 307 South Broadway, Los Angeles, secretary.

LEWIS E. FORD, *Sec'y.*

LIST OF UNITED STATES PATENTS PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING NOVEMBER, 1902.

Nov. 4.—No. 712,526, to PERRY C. HAMMERSMITH. Dental filling tool.
 " "—No. 712,576, to JOHN F. O. McMATH. Dental instrument.
 " "—No. 712,648, to CHARLES P. CALLAWAY. Tooth crown.
 " "—No. 712,701, to ALVIN F. MERRIMAN, JR. Hot-water obtundent handpiece.
 " "—No. 712,705, to WILLIAM H. MOSLEY and HENRY G. ROBB. Porcelain facing for crown and bridge work.
 " "—No. 712,716, to OSCAR H. PIEPER and ALPHONSE F. PIEPER. Dental engine.
 " "—No. 712,813, to FREDERICK W. KORB. Dental plugger.
 " "—No. 713,040, to EMORY L. TOWNSEND. Dental bridge work.
 " "—No. 713,041, to EMORY L. TOWNSEND. Dental band-fitting instrument.
 " 11.—No. 713,103, to FRANK HURLBUT. Dental engine.
 " "—No. 713,273, to ISAAC H. ALEXANDER. Dental matrix crown.
 " "—No. 713,282, to ARTHUR W. BROWNE. Dental chair.

Nov. 11.—No. 713,319, to CHAS. A. LUNDBERG. Dental tool-holder.
 " "—No. 713,330, to MICHAEL J. MURRAY. Mold for forming artificial teeth.
 " "—No. 713,451, to MATHEW M. KERR. Blow-pipe.
 " "—No. 713,453, to JASON D. KINSLEY. Tooth-crown burnisher.
 " "—No. 713,469, to GEORGE G. MARTIN. Dentistry.
 " "—No. 713,470, to WESLEY T. MARTIN. Dental forceps.
 " 18.—No. 713,683, to HOMER POLING. Tooth-brush.
 " "—No. 713,826, to JOHN D. WILKENS. Dental handpiece.
 " "—No. 714,105, to GEORGE EVANS. Dental heater.
 " 25.—No. 714,373, to ASHLEY M. HEWETT and JOHN C. SMITH. Electrical dental furnace.
 " "—No. 714,613, to ADOLPH W. SCHRAMM, EDWARD B. WILFORD, and BENJAMIN FULTON. Handpiece for dental engines.



B. Rathum

THE DENTAL COSMOS.

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No. 2.

ORIGINAL COMMUNICATIONS.

INTRODUCTION TO THE STUDY OF IMMUNITY IN ITS RELATION TO THE DISEASES OF THE MOUTH AND TEETH.

By W. D. MILLER, D.D.S., M.D., Ph.D., Sc.D., Berlin.

(Continued from page 12.)

QUESTION III—*Is any protective action to be attributed to the oral mucus?*

Certain authors, as Triola, Wurtz, Lermoyez, etc., are of the opinion that the buccal and nasal mucus possesses an antiseptic action. Especially the two latter (*Comptes rend. de la Soc. de Biol.*, 1893, p. 756) observed that the anthrax bacillus lost its virulence after having been kept for some hours in contact with nasal mucus, and that other pathological bacteria (staphylococci, streptococci, etc.) showed a marked attenuation. Thomson and Hewleth (*Lancet*, 1897, p. 86), on the other hand, found that nasal mucus possesses a certain retarding influence upon the development of bacteria, but no bactericidal property. Klemperer also (*Münch. med. Woch'ft*, 1896, p. 730) denies the bactericidal property of nasal mucus. Galippe (*Journ. des Conn. méd.*, 1894, p. 124), referring to the frequency of infections on mucus-bearing surfaces, writes as follows: "This bactericidal property must act very intermittently when we take into consideration the many cases of blen-

norrhea metritis, etc. Everyone knows what accumulators of bacteria we have in the lacunæ of the tonsils, as well as the frightfully putrid smell of the conglomerations which form in them." It seems hardly probable that the buccal mucus, in particular, can contain any bactericidal property in view of the fact that the mucous membrane of the mouth is invariably found to be coated with large masses of bacteria.

In the following experiments I have attempted to compare the possible antiseptic action of mucus with that of the saliva of the same person. I have in the course of my investigations repeatedly observed that if we allow saliva to stand in a test tube until the mucus and sediment have been deposited at the bottom of the glass, the clear saliva undergoes a less intense process of fermentation and forms a less amount of acid than that portion containing the sediment or mucus. In the latter case, however, the formation of acid stops, and putrefaction begins, sooner than in the former. These facts I have been able to explain only on the supposition that the saliva

containing much sediment or mucus forms a better medium for the proliferation of bacteria than that free from them. If we pass saliva through a Chamberland filter it appears perfectly clear and thin; the mucus does not pass through except in very minute quantity, but remains in or upon the filter. If we collect this mucus and add to it about 2 per cent. of sugar and peptone, we will find that in a certain period of time it will form more acid than will the clear unfiltered saliva of the same person.

The mucus collected on the filter after filtering 30 c.cm. of saliva, produced in the first twenty-four hours 15, in the second 17 units of acid, against 10 and 9 for normal saliva in the same periods. In a second experiment I obtained the results 10 and 17 against 9 and 14. These results, which show more intense fermentive action in saliva containing large quantities of mucus than in the saliva of the same person comparatively free from mucus, can certainly not be accounted for on the supposition that mucus possesses bactericidal or even retarding influence.

PUTREFACTION OF MUCUS.

When Béchat affirms that mucus does not readily putrefy, his view is not at all substantiated by my observations. If we allow a quantity of saliva to stand for half an hour in a test tube until the mucus has accumulated at the bottom and then pour off the supernatant saliva into a second test tube, and put both in the incubator, we shall find after twenty-four hours that the tube containing the mucus emits a most intense smell of putrefaction and much stronger than that emitted by the tube containing the clear saliva. The buccal mucus even of a person immune to caries showed no bactericidal action upon *B. prodigiosus*. Immediately after inoculating the mucus with this bacterium it contained 277 bacilli per loop; in 1½ hrs., 282; in 4 hrs., 274; in 24 hrs., over 6000; in 48 hrs., innumerable.

How far the oral fluids fall short of exerting a bactericidal action upon the

normal oral flora may be demonstrated by anyone who will carry out the following experiment: In the morning before breakfast thoroughly cleanse the mouth and teeth with the tooth-brush and floss silk until every trace of food deposits, etc., has been removed. Then allow the teeth to go unbrushed for two or three days, limiting oneself as much as possible to the use of soft foods in order that the mechanical cleansing of the teeth by mastication may be reduced to a minimum. One will be astonished at the rapidity with which the teeth become coated and at the immense masses of bacteria which will be found in the deposits upon them. Saliva is not only not able to keep a mouth which has already been thoroughly cleansed comparatively free from bacteria, but permits a very rapid reproduction of the oral flora after it has been mechanically removed. Even when during the time of the experiment only such foods are taken into the mouth as have been sterilized before using,—that is, freed from living germs,—the result will be the same. The large number of different kinds of bacteria which are constantly to be found in the human mouth also furnish strong evidence against the bactericidal properties of saliva.

It is true, not all kinds of bacteria find the conditions necessary for their development in the oral cavity, but this is to be accounted for by various circumstances, among which the struggle for existence and self-destruction play a very important rôle. Notwithstanding this fact, we find in the mouth a richer flora than in any other part of the human body.

THE SALIVA OF CARIOUS IMMUNES.

QUESTION IV—*Do the bactericidal properties of the saliva exist in a more marked degree in persons immune to caries than in those highly susceptible?*

Having been forced to the conclusion that human saliva does not possess the power of preventing the development of bacteria under otherwise suitable con-

ditions, or even of retarding it in any detectable degree, I next carried out a long series of experiments for the purpose of determining whether there is any difference in the intensity of processes of fermentation in the saliva of such persons as are immune to caries and that of those who are highly susceptible.

In order to adapt the conditions of experiment as closely as possible to those present in the mouth, I proceeded as follows:

A number of test tubes were each filled with 5 c.cm. of saliva of different persons, susceptible and immune, and to each 0.1 gm. peptone and 0.1 gm. grape sugar or pulverized bread added. The tubes were then put into the incubator and the amount of acid determined which was formed in the different tubes in equal periods of time. In the first place I compared the fermentation of the saliva of D and E, which was rich in potassium sulfocyanid, with that of F, which contained but a trace of that substance:

	I.	II.	Total.
D (av. of 2 exp.)	9	15½	24½
E " 2 "	8½	12½	21
F " 3 "	9½	14	23½

A comparison of the saliva of A, immune, with G, relatively immune, and C, highly susceptible, gave the following results:

	I.	II.	III.
A	7½	6½	2½
C	12¾	7¾	alkaline.
G	10¼	4½	"

Here we find an appreciable difference in favor of A; his saliva was clear and formed but little sediment on standing; it contained accordingly comparatively little organic substance, which may in part account for the smaller amount of acid. The saliva of C and G was cloudy and formed a thick mucous sediment.

Further experiments were carried on with the following results:

	I.	II.	Total
A	9	10½	19½
B	10	10	20
C	15	8¾	23¾

	I.	II.	Total.
A	9½	7½	16½
B	12½	6½	19
C	12½	9½	22

	I.	II.	Total.
A	8	11	19
B	8½	12	20½

Comparison between saliva of A and C with 2 per cent. peptone and 2 per cent. pulverized bread:

	I.	II.	Total.
A	7	14	21
C	12	11	23

Comparison between that of A, G, and H with 2 per cent. peptone and bread, on the average:

	I.	II.	Total.
A	3½	8	11½
G	6	9½	15½
H	4¾	10½	15½

Comparison between the saliva of the immune A and the highly susceptible O with 3 per cent. peptone and grape sugar:

	I.	II.	Total.
A	12	12	24
"	12	11	23
O	12	11	23
"	12	10	22

	I.	II.	III.	Total.
D	9	15½	0	24½
E	8½	12½	8	29
F	9¾	15½	3	28½

Between C and E with peptone and starch:

	I.	II.	III.	Total.
C	11	13	15	39
E	5	12	6	23

Between a mixture of the saliva of B and C, and H, with 3 per cent. peptone and bread:

	I.	II.	III.	Total.
Mixture of B and C	10	20	5	35
H	8½	17	8	33½

Between E and the very susceptible L (poor in potassium sulfocyanid), 5 c.cm. of saliva with 0.1 gm. peptone and 0.1 gm. pulverized bread. Eight experiments with E and four with L, prolonged for 96 hrs.:

	I.	II.	III.	IV.
E	7	8	6	2
"	8	7	6	0
"	7	7	6	4
"	7	7	6	2
"	8	6	6	0
"	7	5	6	3
"	7	5	6	
"	7	5	6	
Average	7½	6½	6	2

	I.	II.	III.	IV.
L	7	7	7	4
"	6	7	5	5
"	6	6	6	0
"	6	6		1
Average	6½	6½	6	2½

Comparison of the saliva of B with that of the highly susceptible N:

	I.	II.	III.
B	8¾	10	0
"	10	10	0
N	5	7½	7½
"	5	6½	3½

Here we see that the saliva of the highly susceptible N forms much less acid than that of the relatively immune B.

Comparison between the saliva of P, with very badly decayed teeth, and the immune Q:

	I.	II.	III.	IV.
P sediment	14	13	1	alkaline.
" clear	12	9	9	"
Q	8	8	10	"
"	8	10	9	"

Between A (immune), B (relatively susceptible), and R (edentulous):

	hrs.	I.	II.	III.
A sediment	5	11	13	0
" clear	2	10	11	16
B sediment	5	14	14	0
" clear	2	11	14	0
R	3	10	12	10

RESULTS THUS FAR NEGATIVE FOR ANTI-SEPTIC VALUE OF SALIVA.

Many other comparative experiments of this nature were carried out with the saliva of persons with little or no caries and those suffering very much from this

disease. I was not, however, able to find in the saliva itself any factor which gave a satisfactory explanation of the immunity in one case and the susceptibility in the other. I have found, it is true, that saliva of immunes, *as a rule*, produces less acid by fermentation in a given time, especially in the first twenty-four hours, than the saliva of susceptible persons. This fact is brought out in experiments with the saliva of the immunes A and Q. The difference was, however, not constant, and I have sometimes found in the former case quite as high a degree of acid as in the latter, and in some cases, indeed, the saliva of a highly susceptible person has produced less acid than that of a comparatively immune (see comparison between B and N).

We have here a factor which should not be altogether overlooked, although it certainly is not of sufficient importance to account for the immunity in one case and the susceptibility in another. I am not quite prepared to state why the saliva of one person more readily undergoes fermentation than that of another, and shall reserve a further discussion of the question for a later occasion.

Naturally the reaction of the saliva at the beginning of the experiment, as well as the presence of certain salts, in particular carbonates, influence the amount of free acid appearing in the first twenty-four hours.

DEFENSIVE PROTEIDS IN THE SALIVA.

QUESTION V—*Does the fresh saliva contain bactericidal substances analogous to the alexins of the blood, which become inert on standing?*

We know that with very few exceptions pathological bacteria exert a deleterious influence upon the human body only through the medium of the poisons which they produce. These bacterial poisons possess a virulence exceeding that of the most poisonous alkaloids (strychnin, atropin) produced by higher plants, and it is consequently an exceedingly subtle and dangerous weapon which bacteria make use of in their at-

tacks upon the human or animal body. Fortunately, however, the human organism possesses equally subtle weapons which enable it to carry on the battle against the invading foe.

On the one hand the amœboid cells (lymphocytes and related cells) attack the bacteria, taking them up in very much the same manner as an amœba takes in small particles of nourishment and digests them—a process well known under the name of phagocytosis. On the other hand, the body protects itself either by producing a counter poison which neutralizes the poison produced by the bacteria and so renders it innocuous, as is the case in diphtheria and tetanus, or by producing substances which have no action upon the bacterial poisons, but which destroy or weaken the bacteria themselves, *i.e.* not antitoxic but bactericidal substances, as is the case in cholera, typhus, etc.

We cannot here enter into a discussion of the question as to where these protective substances (alexins) are formed; suffice it to state that at the present time the view is almost universally accepted that they have their origin in the white blood-corpuscles and related cells, and do not find their way into the extra-cellular blood-current until these cells have suffered some injury which permits the alexins to escape. These protective substances are present in a weak form in normal blood serum, and their action is of a quite general nature, *i.e.* directed against all kinds of bacteria. When, however, any pathogenic micro-organism finds its way into the human body, that protective substance of the blood which performs the part of an antitoxin to the poison produced by the germ in question, or of an antibacteritic to the germ itself, increases to such an extent that the blood acquires a specific action, directed apparently only against the one bacterium or its products.

These protective substances appear in the secretions and excretions of the human body (milk, urine, etc.), but in much lower concentrations than in the blood itself. According to the investigations of Wassermann (*Zeitschr. f.*

Hygiene, Bd. 18, 1894, p. 248), the immunizing power of milk in diphtheria and tetanus stands to that of the blood as 1:15 to 1:30.

PROTECTIVE SUBSTANCES MAY EXIST IN SALIVA.

It is now very natural to suppose that these protective substances may appear in very slight quantities also in the saliva, although, as far as I am aware, no experiments have been made to test the truth of this supposition. We have, however, in the East Indian snake-charmers a celebrated example of a case in which a protective substance seems to be present in the saliva. These snake-charmers treat snake-bites by the application of saliva to the wound, having previously acquired immunity by allowing themselves to be bitten at first by very small snakes and gradually by larger and larger ones, until they have accustomed themselves to the poison in pretty much the same manner as one accustoms oneself to nicotine, until they can subject themselves to the bite of the largest snake without suffering any deleterious effects. Apparently the antitoxin formed in the blood passes also into the saliva. In all probability, too, the saliva of persons suffering from diphtheria contains the diphtheria antitoxin; that of persons suffering from cholera a substance which exerts a bactericidal effect upon cholera bacilli, etc. We know that in the case of pneumonia a substance appears in the saliva which has a deleterious effect upon pneumococci inasmuch as they lose their virulence during an attack of pneumonia, to regain it again later. We cannot enter into a more critical study of this increased formation of specific protective substances, as their action is always one-sided and directed solely against the particular bacterium (or its poison) which is the cause of the infection.

We know, however, that the normal intra- or extra-vascular blood serum of man and animals contains substances, named alexins by Buchner, which possess bactericidal properties of a universal nature and not directed solely against

one particular kind of bacterium as is the case in artificial immune sera. These substances exert their action not only in the living human and animal body, but, as first shown by Metchnikoff, *in vitro* as well. They have been the subject of most exhaustive studies which have added much to our knowledge of their nature and action but have still left to be solved many problems regarding them.

NATURE OF THE ALEXINS.

The experiments of Metchnikoff, Bordet, Ehrlich, Wassermann, and hundreds of others have shown that these alexins are of a most complicated nature,—that, in fact, we have to do with two different substances or components, one of which has been called “complement” (*cytase* of Metchnikoff), the other amboceptor *Immunkörper*, *Zwischenkörper* (*fixateur* or *substance sensibilisatrice* of the French authors).

The first of these components, the complement, is of the nature of a ferment; it is destroyed by exposure to a temperature of 55°-60° C. for half an hour, and is on the whole very unstable and readily decomposed, blood serum losing its bactericidal power for the most part, or completely, inside of twenty-four hours on account of the decomposition of the complement.

The second component (amboceptor) is a more stable compound, and may be exposed to temperatures of 55° C. and above for some length of time without suffering any change. Its function consists in preparing the bacteria or other cellular elements for the action of the complement, or in forming the bridge, so to speak, by which the complement obtains access to the bacteria. The relation of this component to the protective action may be compared to that of *B. aceticum* to the acetic acid fermentation, which consists in transferring the oxygen of the air to the alcohol.

According to Ehrlich's conception, we have not only one but a large number of complements in normal blood serum by which the fact may be accounted for that the bactericidal property of the blood

is general in its nature and not directed against any one particular kind of bacterium. In artificial immunity the blood does not lose its general bactericidal properties, but one of the amboceptors, which possesses the property of a specific antistuff for the poison inoculated, increases to such an extent that the general action disappears in comparison with the specific.

It appeared to me, *a priori*, very doubtful if there were any substance in the human saliva which could be compared with the complement of the blood, since the saliva contains but few leucocytes, and since the various experiments above described have led to the conclusion that saliva does not possess any kind of bactericidal action.

WORK OF HUGENSCHMIDT.

Hugenschmidt is the only one, as far as I know, who has occupied himself experimentally with this question. In a series of experiments carried out in the laboratory of Metchnikoff, he found that saliva exposed for half an hour to a temperature of 60° C. seemed, in some cases, to possess a slight antiseptic action as compared with normal saliva,—quite the contrary to what would have been the case if there had been a substance analogous to the complement present, as in this case the exposure would have destroyed the antiseptic action. If there were any substance or substances in the saliva analogous to the complements in the blood, which impart to it an antitoxic or bactericidal property, they would be destroyed, as already stated, by exposing the saliva for half an hour to a temperature of 55-60° C., and the saliva would consequently lose its antiseptic action. If we should then add to this heated (inactivated) saliva a few drops of fresh saliva, it would thereby be reactivated,—that is, regain its antiseptic action in virtue of the complement (ferment) contained in fresh saliva,—and consequently we would expect to find that heated saliva to which a few drops of normal saliva had been added would possess the same bactericidal power as fresh saliva, and

accordingly more than the heated saliva which had not been reactivated.

THE EXPERIMENTAL TEST FOR ALEXINS.

In order to test this question experimentally, I filled three test tubes with equal quantities of saliva filtered through paper. The first tube was left unchanged, the second and third were kept for half an hour at a temperature of 55-60° C., and to the third three drops of fresh saliva were added. All three tubes were then infected with *B. prodigiosus*, and were tested from time to time as to the number of bacteria they contained, with the following results:

	Non-heated saliva.	Heated saliva.	Reactiva- ted saliva.
At first	8	16	11
After 1 hour	13	28	15
After 2½ hours	21	12	16
After 23 hours	690	159	488

We see that in the normal saliva, as well as in the reactivated, a gradual increase in the number of bacteria has taken place. In the heated saliva, in which the complement, if any were present, and consequently the antiseptic action, would have been destroyed, a less rapid development took place, a result which, like that obtained by Hugen-schmidt, is just the contrary to what we should find in experiments on the blood or any other substance actually containing protective substances of the nature of complements.

We accordingly search everywhere in vain for any property in the saliva which might be designated as bactericidal and which could furnish us with an explanation of the relative immunity of the organs of the mouth.

We must not, however, overlook the fact that, although all of the experiments recorded above point to the conclusion that saliva does not possess bactericidal properties, the possibility is thereby not excluded that it may possess antitoxic properties,—that is, that it may be able to neutralize toxic substances formed in the mouth and render them innocuous. Wehrmann (*Ann. de*

l'Institut Pasteur, 1897, t. xii, p. 510) found that the ptyalin of human saliva mixed with a quantity of snake-poison which would otherwise prove fatal in a very short time, rendered it completely harmless. It is barely possible that the habit, widespread even among civilized peoples, of moistening the bites of insects with saliva may have a logical foundation in this property of the saliva for rendering toxic substances innocuous. I shall return to this point, however, on a subsequent occasion.

A discussion of Question VI is reserved for a future communication.

THE BIOLOGICAL FACTOR.

QUESTION VII—*What part does the struggle for existence play in the human mouth?*

In all cavities of the human body which are lined with a mucous membrane a process of auto-purification, a self-cleansing seems to take place which in the one case is very pronounced and in the other scarcely detectable. This process has been most thoroughly examined in the case of the vagina. The vagina of newly born girls is free from bacteria. Soon after birth, however, a number of different kinds, which we may call the normal vaginal flora, establish themselves. Among these the bacillus of Doederlein seems to be the most important. If we introduce various species of bacteria into the vagina before the normal flora has been established, they are found to perpetuate themselves for some length of time. If, however, they are not introduced until after the normal flora has established itself, they diminish very rapidly and soon disappear altogether.

According to the investigations of Menge and Krönig (*Bacteriol. des weibl. Genital-canals*, Leipzig, 1897), of Doederlein, Stroganoff, Metchnikoff, etc., various factors act together in bringing about the auto-purification of the vagina:

(1) The acid reaction of the mucus, which is favorable only to acidophile bacteria, to which group the vaginal

flora belongs. (2) The accumulation of leucocytes which takes up many of the bacteria introduced and destroys them. (3) The mechanical expulsion which probably performs a very considerable rôle. Chiefly, however, (4) The vagina is indebted for its auto-purification to the acidophile bacteria, its normal flora, which prevent the proliferation of other kinds of bacteria,—by which Menge explains the fact that staphylococci introduced into the vagina did not begin to disappear until the normal flora had been established.

In the case of mares, of which the vaginal secretion is alkaline, Cahanesco attributes the auto-purification chiefly to the intense phagocytosis; the secretion showed no bactericidal properties whatever. In the case of bitches, female rabbits, guinea-pigs, etc., the auto-purification takes place but slowly and imperfectly.

The auto-purification of the nasal cavity is brought about in part mechanically through the expulsion of the mucus, by which great numbers of bacteria are carried off,—a process which is assisted by more or less pronounced phagocytosis. It is a disputed question whether the nasal mucus possesses bactericidal properties or not, as the experimental results obtained by different observers stand at variance with each other. The question as to the existence of the normal nasal flora and as to the part which it performs in keeping down the growth of other bacteria has unfortunately not yet received the attention which it deserves, and I am not able to produce any observations regarding it.

The self-cleansing process in the mouth of human beings, as well as of animals, is one which should greatly interest everyone. Here, in comparison with other cavities, a complication of considerable importance is presented by the presence of the organs of mastication, which furnish centers of retention and stagnation that materially hinder the process of cleansing. In a toothless mouth the auto-purification goes on more perfectly.

AUTO-PURIFICATION OF THE ORAL CAVITY.

In the process of auto-purification of the oral cavity the following factors come into consideration: (1) The mechanical action of mastication. At every meal, unless restricted to very soft food, deposits and precipitates containing millions of bacteria are rubbed off the teeth and mucous membrane and passed on into the stomach. The importance of this factor appears very clearly in cases where a person for some cause or other has restricted mastication to one side of the mouth; how quickly unused teeth become coated with deposits is very well known to every dentist. The thoroughness of the mechanical self-cleansing depends to a certain extent upon the form and position of the teeth and particularly upon the physical properties of the food. We find that even the teeth of dogs appear dirty whenever, as is frequently the case with lap-dogs, they become loosened by pyorrhea and can no longer be used for mastication. (2) The saliva exerts a certain amount of influence in dissolving soluble substances and carrying them off along with bacteria and fine particles of food, as well as in diluting to a certain extent products of fermentation which are injurious to the teeth. (3) Phagocytosis does not appear to perform a very important function under ordinary circumstances. This question, however, will receive the consideration which it merits in a later communication. (4) Bactericidal properties of the saliva, which might come into play in the process of cleansing are not present in sufficient strength to be detected by any of the methods above employed. A question deserving of very close study is that (5) of the part which the struggle for existence plays in restricting the growth of bacteria in the mouth. With a view to determining the action of this factor, the following experiments were undertaken:

Two test tubes were filled each with 5 c.cm. of fresh saliva, and to one of them 2 per cent. of grape sugar and peptone were added. Both tubes were then infected with *B. prodigiosus*, and after

the saliva was well shaken the number of this bacillus per loop of saliva was determined by the ordinary method. The tubes were kept in the incubator and the number of prodigious bacilli which they contained was again determined in $\frac{1}{2}$, $1\frac{1}{4}$, 24, and 48 hrs., with the following results:

	Saliva without sugar.	With sugar.
Bacteria at beginning.....	20	337
“ after $\frac{1}{2}$ hour	24	350
“ “ $1\frac{1}{4}$ hours	25	286
“ “ 24 “	76	0
“ “ 48 “	39	0

We see that the number in the tube containing peptone and sugar very rapidly decreased, so that after twenty-four hours they had entirely disappeared. In the saliva which contained no peptone and sugar the bacilli were not so rapidly destroyed, although here also the development was exceedingly meager. We have already seen, however, that saliva alone possesses no antiseptic action for *B. prodigiosus*, and that this bacterium develops very well at room temperature in saliva filtered either through a Chamberland filter or only through paper; in such cultures we often find innumerable bacteria at the end of twenty-four hours.

B. prod. also develops very rapidly under normal conditions at the temperature of the human body, so that the only factor which can account for its destruction in the above experiments is the struggle for existence with the oral bacteria present in the saliva. That it is here really the struggle for existence by which *B. prod.* becomes eliminated seems to be proved by the fact that when the saliva is passed through filter paper, by which means by far the greater majority of the bacteria are removed, this bacillus is able to maintain itself for a greater length of time, as is seen in the following experiment, although here also it is finally destroyed:

Bacteria at beginning	298
“ after $1\frac{1}{4}$ hours	231
“ “ 17 “	960
“ “ 24 “	620
“ “ 3 days	0

If added to saliva *in sufficient numbers*, *B. prod.* is able to hold its own for some time even at the temperature of the body when sugar is not present. For example:

Bacteria at beginning	9,600
“ after 22 hours	22,200
“ “ 48 “	12,000
“ “ 3 days	775
“ “ 4 “	13
“ “ 6 “	0

At room temperature, the oral bacteria being paralyzed by the cold, the prodigious increases with great rapidity. For example:

Bacteria at beginning	7,800
“ after 22 hours	39,900
“ “ 48 “	600,000
“ “ 3 days	innumerable.
“ “ 4 “	“

The next experiment brings the struggle for existence still more clearly to view. I thoroughly rinsed my mouth with a bouillon culture of *B. prodigiosus* containing over 2,000,000,000 bacilli, forcing the liquid between the teeth in order to give the micro-organisms a chance to establish themselves in “out-of-the-way places.” Immediately afterward and again at the end of 1, 2, 3, 6, and 18 hours, I determined the number of bacilli in a loop of my saliva. The following are the results:

Bacteria at beginning	97,600
“ after 1 hour	1,220
“ “ 2 hours	127
“ “ 3 “	17
“ “ 6 “	0

Here we see an astonishingly rapid decrease of bacteria,—at the end of the third hour only 17 per loop being left instead of 97,600,—and it is reasonable to suppose that at the end of the fourth hour the prodigious had already completely disappeared from the mouth. The rinsing of the mouth with a culture of prodigious caused a slight flow of saliva which made it necessary for me to swallow or expectorate occasionally during the course of the experiment, which may have contributed somewhat to bring about such a rapid decrease in the number of bacteria. This, however,

could not account for the total disappearance of the bacilli, since we know very well that by no amount of swallowing or spitting can we free the mouth of its germs.

Undoubtedly very many other bacteria which from time to time obtain access to the human mouth suffer the same fate as *B. prodigiosus*, in that they are driven to the wall in the struggle with the normal flora that are already established therein.

INFLUENCE OF THE STRUGGLE FOR EXISTENCE UPON SPECIFIC PATHOGENIC BACTERIA IN THE ORAL CAVITY.

It would be a matter of intense interest to determine in which manner and to what extent pathogenic bacteria, not normally inhabiting the mouth, such as the tubercle, cholera, typhus, and other bacilli, are influenced by the struggle for existence with the oral flora. Experiments carried out in the mouth with those bacteria are, however, so dangerous that up to the present I have not had the courage to undertake them, while results obtained from experiments on animals are not conclusive, since the saliva of animals varies very materially in composition from that of man. But, taking into consideration how widely the above-mentioned micro-organisms, and particularly the carriers of tuberculosis and syphilis, are distributed, we must infer that they frequently find entrance into the mouth, and that they must be very soon eliminated again, otherwise primary tuberculosis and syphilis of the mouth would be much more common than they are.

DESCRIPTION OF THE PERSONS REFERRED TO IN THE EXPERIMENTS ON SALIVA.

"A." Dentist, thirty-five years of age, perfect general health, with slight tendency to pyorrhea alveolaris. Strong, yellowish teeth without a trace of caries, *i.e.* immune. Saliva clear, thin, forms considerable sediment on standing. Reaction of saliva at 11 A.M. slightly acid to neutral. Potassium sulfocyanid = 0.0125 per cent.

"B." Professor of medicine, forty-nine years of age, in perfect organic health but formerly a pronounced neurasthenic. Teeth of average structure and average tendency to decay. Re-

action of parotid saliva acid, of sublingual alkaline; total reaction about neutral.

"C." Servant, thirty-nine years of age, teeth except lower incisors all decayed to the gums. Saliva exceedingly ropy, cloudy with varying quantities of sediment. Sulfocyanid = 0.003.

"D." Student of twenty years, in good health. The four first molars wanting, two of the remaining teeth carious, in one the pulp dead. Sulfocyanid = 0.01.

"E." Student of nineteen years, in good health. Twelve decayed teeth, in five the pulp dead. Sulfocyanid = 0.01.

"F." Student. One tooth extracted, fourteen fillings (of these two root treatments) in upper jaw, one in lower. Sulfocyanid = 0.001.

"G." Physician forty-three years of age. Comparatively free from caries, gouty diathesis. Sulfocyanid = 0.009.

"H," "I," "K." Orphan girls, eleven to thirteen years of age. Teeth neglected and in a general condition of ruin. Reaction: H slightly acid, I and K neutral to alkaline.

"L." Nurse, nineteen years of age. Teeth nearly all more or less decayed. Saliva exceedingly foamy, neutral. Sulfocyanid = 0.003.

"M." Dentist, twenty-six years of age. Thirty-two teeth, with only two small fillings. Reaction neutral. Sulfocyanid = 0.003.

"N." Secretary, about forty years of age. Universal caries. Saliva transparent, ropy, but little sediment, neutral. Sulfocyanid = 0.003.

"O." Woman in her forty-second year, with eight children. Twenty-three teeth, of which thirteen with extensive acute caries. Saliva exceedingly ropy, foamy, slightly alkaline.

"P." Servant girl, fifteen years of age. Teeth badly decayed. Saliva cloudy, moderately ropy. Reaction at 11 A.M. slightly acid. Sulfocyanid = 0.009.

"Q." Dentist (Chilean), thirty-five years of age. Strong, yellow teeth without a trace of caries. Saliva semi-transparent, slight sediment thin. Sulfocyanid = 0.007 (?).

"R." Toothless woman, sixty years of age.

"S." Toothless woman, fifty-seven years of age. Lost most of her teeth in her twenties. Sulfocyanid = 0.002.

(But little importance is attached to the reaction of the saliva as given above, as it acquires significance only when taken repeatedly and at various hours of the day.)

The results recorded in this paper are given as little more than an introduction to a subject of vast extent and importance, to which I hope to be able to furnish further contributions in the future.

(To be continued.)

THE "A B C" OF CROWN AND BRIDGE WORK.

By FRED. A. PEESO, D.D.S., Philadelphia, Pa.

(Continued from page 20.)

WE do not by any means wish to convey the idea that crown and bridge work is suitable at all times and in all places, a sort of a cure-all for everything, but it is unquestionably true that in a large number of cases—perhaps in the majority of them—where partial plates are now worn, bridge work would be much better adapted and would give far greater satisfaction and be more beneficial to the health of the patient. There can never be the stability to a plate that there is to this form of denture, and the work of mastication is less thoroughly performed with a plate than where a bridge is used.

WHEN AND WHERE CROWN AND BRIDGE WORK IS OR IS NOT INDICATED.

There are a great many cases which at first glance may seem to be ideal ones for bridge work, but which, after a close and careful study of all the conditions, may prove to be at least doubtful. Again, there are others which at first look unpromising, or entirely unsuitable, but eventually turn out to be of the best.

It is very difficult sometimes for the dentist to prevent the question of remuneration influencing his judgment. His first thought should always be, What would I, with my present knowledge of the situation, advise if the work were to be done in my own mouth? He should be honest with himself and then he will be honest with his patient. In other words, he should not work for the present alone, but should think how the work will stand after years of use.

There can be no set rules laid down to tell just when and where bridge work should or should not be used. There are so many conditions to be thought of, so many details to be considered about the work, that the dentist will have to rely largely upon his own good sense and good judgment. If he is in doubt, he should

seek advice from someone who is well versed in the subject and competent to give it. If he feels that any case is beyond him, or that his experience will not warrant his doing it at the time, he should not undertake it for fear that he will lose the patient if he does not. If it be possible, he can make something temporary, to tide the patient over until he *has made himself able* to do it. In the meantime he can work and study until he feels that he is capable of doing the work in such a manner that it will be a benefit, rather than a detriment, to the patient, and also be a credit to the operator.

BRIDGE WORK IN RELATION TO PATHOLOGICAL CONDITIONS OF THE SUPPORTING TEETH AND OF THE MOUTH.

When contemplating this work, the dentist should take note of everything having relation to it, and nothing should be unconsidered or left to chance. He should study the condition of both the mouth and the patient, generally as well as locally. As the general physical condition of the patient is affected by the condition of the mouth, so is the mouth affected by the physical condition of the patient. Each part is to a greater or less extent dependent on the other.

If there be a natural tendency on the part of the patient to pyorrhea alveolaris, the dentist should ponder well as to the effect it might have on his work. He should make careful inquiry and find out how the missing teeth were lost, and should see whether or not the affected parts will yield readily to treatment. He should use the utmost care and thoroughness, for there is no telling how the future of a young practitioner may be affected by his diagnosis and treatment in a case of this kind.

With a good many people there seems to be a natural predisposition toward

pyorrhea. The presence of pus is disagreeable, and although the patient may suffer very little pain, or none whatever, yet the teeth loosen and fall out while still perfectly sound. It would be folly, or worse, to think of putting bridge work in such a mouth as this, and would only serve to bring deserved reproach upon the operator.

Very frequently there is a condition encountered which resembles pyorrhea, the teeth being loose, the gums irritated and puffy, with pus present, but not the characteristic pyorrhea pocket. This state is generally brought about by some external irritation, such as from tartar, toothpicks, ligatures, wearing of plates, etc.—a localized gingivitis that usually will readily yield to treatment, but it should not be confounded with true pyorrhea.

Renal disturbances, especially diabetes, may also be reflected in the mouth. With this last disease there is a condition known as the diabetic mouth. After having once seen a mouth of this description there is not much likelihood of its being forgotten. The symptoms are suppression of salivary secretion and a peculiar livid appearance of the gums, which bleed at the slightest touch.

There is also a viscid, sticky exudation from around the necks of the teeth. Frequently, too, ulcers will appear in different parts of the mouth as well as on the body and at the articulations of the hands and feet. Of course, in a case of this kind, there should be no thought of bridge work. Local treatment will be unavailing, and the patient should at once be referred to his physician.

To cite a case in point: A few years ago, a patient in whose mouth a couple of pieces of bridge work had been doing service for several months, presented himself, complaining of trouble in his mouth and wishing to have his teeth and gums treated. A careful examination was made and the condition was found to be the same as already described, with the exception of there being no pus present. On being asked as to the length of time that had elapsed since he had been examined by a physician, especially in relation

to the condition of his kidneys, the answer was that it had been at least ten years. He was told the significance of the symptoms, and that the dentist could do nothing for him, and he was advised to consult a specialist without delay. He left the office immediately and visited his family physician, who confirmed the diagnosis and at once put him under a course of treatment. His trouble had not been of long enough duration to banish hopes of a cure, which was eventually effected, and the mouth then resumed its normal appearance.

A few months before this patient first appeared, the writer had the opportunity of seeing a patient in whom all of the symptoms above described were present, even to the ulcerated condition of the mouth, the ulcers also appearing on the articulations of both hands and feet, as well as on other parts of the body. In this case the disease was of such long standing that there was no possibility of a cure, and the patient died.

Another very frequent cause of the loosening of the teeth is alveolar abscess. This disease, especially when the abscess has become chronic, is often accompanied by a necrotic condition of the root or alveolar process, or of both, but will generally respond easily to treatment.

Malarticulation is very frequently responsible for looseness of the teeth. When this is the case, it is almost always easily cured by grinding the tooth and correcting the articulation.

A tooth may become loose from having nothing to do. Nature has no need for useless appendages, and if a tooth has nothing to antagonize it it will eventually be thrown out of the socket, but if through the introduction of a proper form of denture, well made and correctly articulated, the normal function is restored, the tooth will resume its natural condition of rigidity in the socket. Of course, where it has elongated to such an extent that it is only held in place by the attachment of the gum, it should be removed. If a tooth be loose, the dentist must endeavor by careful treatment to tighten it up so that it will be firm in its socket. Whatever the cause, that

cause must be removed if a cure is to be effected. If there be no response to the treatment adopted, some other tooth must be chosen in its stead to serve as an abutment, or some other scheme must be devised to restore the missing teeth.

THE STRENGTH OF THE ABUTMENTS.

Another thing which will have to be thought of in connection with this work is the *relative strength* of the different teeth. It is not so much the number as it is the character of the teeth that are to serve as abutments which is the important question. A tooth which is naturally weak should not be expected to do the same amount of work as one that is much heavier and stronger. Each tooth should be studied separately, in order to get an idea as to how much strain can be put upon it.

In the upper jaw the central incisors are stronger teeth than are the laterals. The canines will do more work than the bicuspid or any of the anterior teeth. In fact, these are about the strongest teeth in the mouth and constitute the best abutments for crown and bridge work. The bicuspid are good anchorages if too much is not expected of them. The first and second molars are very strong and make good abutments, but the third molars are much more uncertain and cannot be depended on to the same extent as the first and second. There are a great many instances, however, where these teeth are exceptionally good and will do their share of the work in supporting a bridge as well as the others for a great many years; but they should be carefully examined before utilizing them. One probable reason for their frequent failure to do their work satisfactorily is the fact of their being situated so far back in the mouth; consequently it is so difficult—at times being next to impossible—to get at them in trimming, that they are more apt to be slighted than are the other teeth. The very fact of their being so difficult of access should tend to make the operator more careful and painstaking and devote more time to their preparation. Were this really the case it is probable that

there would be more successes, and the poor "wisdom tooth" would not be so much maligned as it is now.

In the lower jaw the lateral incisors are stronger than the centrals, which are the weakest teeth in the mouth, but, notwithstanding this fact, they are frequently of great value in this work. The relative strength of the other teeth in this jaw is about the same as it is in teeth of the upper jaw.

The form of the arch, too, has a great deal to do with the carrying capacity of the teeth. A bridge which in one mouth would be of the utmost value to the patient, in another, with exactly the same anchorages, all in an equally good condition, might prove to be far more detrimental than beneficial.

CASES PROPER FOR BRIDGE WORK.

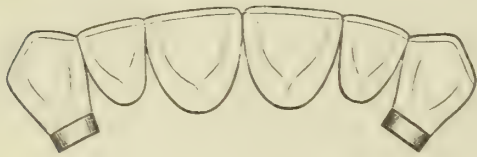
It is not possible for anyone to specify all of the situations where bridge work is, or is not, suitable, but we will endeavor in a general way to give an idea as to what may be expected of the different teeth, and will take up special cases when we come to describe the manner in which the prosthetic work is done. No two cases are alike, and each one will have to be studied by itself and decided on its own merits.

We will begin with the anterior part of the mouth.

Where the two lateral incisors have been lost, the central roots can be safely trusted to support two lateral dummies, but it would not be reasonable to expect them to do more. When the centrals are missing, the lateral roots are usually sufficiently strong to carry a bridge restoring them, but in the case of an exaggerated V-shaped arch there might be an undue strain on the roots which would tend to weaken them. A right central and left lateral will form good anchorages to carry the left central and right lateral dummies, and *vice versa*. Where the central and lateral, both of the same side, are lost, the central and lateral roots of the opposite side should not be expected to carry a bridge restoring them, without some assistance from the canine. Where all of the incisors have been lost,

if the arch be broad and the canines stand well apart, so that the teeth to be restored can be placed in nearly a straight line, as in Fig. 26, a serviceable

FIG. 26.



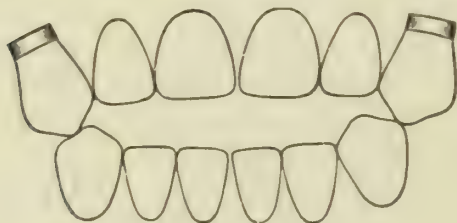
bridge may be made which will last for many years and be a great comfort and benefit to the patient. Where the arch is very narrow or V-shaped, and the canines are close together, so that the incisors would have to be placed so as to curve outward, projecting far beyond the line of the abutments, as in Fig. 27, it

FIG. 27.



would be risking a great deal to trust to the canines alone to carry such a bridge. In a case of this kind the leverage would be so great that the constant strain on the bridge in biting would tend to loosen the roots, forcing them outward and upward, so that in time the incisive edges of the upper and lower teeth would be far apart, as in Fig. 28.

FIG. 28.



If the bridge be extended so as to take in the bicuspid, it will make a very much stronger piece, as these two anchorages, in addition to the canines, will render it more rigid and the broad masticating surface of the bicuspid make it less liable to tilt upward in the front.

These conditions obtain more especially in the case of fixed bridges. With removable work, the possibilities of bridge work are greatly increased. Where the six anterior teeth are lost, it is perhaps as well to give up the thought of bridge work and trust to a plate. However, under favorable conditions, a satisfactory removable bridge might be made, but it is well that the dentist should not take too many chances of overstraining the abutments.

Where the canines and the first, or both, of the bicuspid are missing, the operator would be hazarding a great deal to undertake to make the lateral incisor and the second bicuspid or first molar carry a bridge. In the first place, the lateral is too weak a root to do the work which it would have to do in a case like this, even if the position of the tooth were such that the bridge could be made in nearly a straight piece; but occupying the position in the arch which it does, the canines would stand beyond the line of the abutments and the leverage would be so great as to loosen the tooth and render the piece worthless in a very short time. (Fig. 29.)

FIG. 29.



To place a bridge from the canine to the first molar, or even to the second, is good practice, and such a piece will give satisfaction. Sometimes, where the third molar has moved forward a good deal and is in good condition, the bridge might even be extended to that tooth.

It might be as well to mention at this point that a longer bridge can be put in where a plate is worn in the opposite jaw, than there can be when the bridge occludes with the natural teeth. Whether it is that there is not the same force exerted in mastication when a plate is used, or that the effect is due to the yielding of the soft tissues, the fact re-

mains that there does not seem to be the same strain on the abutments.

A condition frequently encountered is where the first bicuspid and first molar are missing and the second bicuspid and second molar are still in position. (Fig. 30.) These will furnish excellent sup-

FIG. 30.



port for a bridge restoring the lost teeth, and at times, should it be desirable, another dummy might be extended so as to restore the third molar, but it is best not to overdo the matter by making the abutments carry too much.

The first or second bicuspid and the second or third molar give good support. Where the molars are all lost, they can only be restored with removable work.

FULL BRIDGE RESTORATION.

In order to restore the full set of teeth in the upper mouth, there should be at least four good, strong teeth or roots to serve as abutments, the two canines and a first or second molar on each side. In a bridge of this description the teeth are doing four times as much work as they were originally intended to do, but if the roots are good and sound and are properly prepared and the bands accurately fitted so that there will be no gingival irritation, there is no telling for how many years these four teeth will do the work of fourteen or sixteen. It is certain that a denture of this kind may be in seemingly as perfect a condition after ten or twelve years of use as it was when first put in the mouth. Where the two central roots are in position, of course they give greater strength to the piece, and each additional tooth adds just so much to the chances of a long life for the bridge.

A larger bridge may be placed on the same number of roots in the lower mouth

than in the upper, as having gravity in its favor. Saddle pieces are possible, which in the upper could not be thought of and of course would have to be made removable. The advantages and disadvantages of removable and fixed bridge work will be discussed later.

CROWN AND BRIDGE WORK IN RELATION TO THE VITALITY OF THE PULPS IN THE SUPPORTING TEETH.

This is a most important subject and requires serious consideration on the part of the operator. Since crown and bridge work became a legitimate procedure in dentistry, the question as to the advisability of putting a crown on a tooth having a living pulp has been, and still continues to be, agitated, with the prospect of its being settled seemingly as far away in the dim and distant future as it was when first the discussion was started. A great deal has been said and written on the subject to prove on the one side that a tooth should always be devitalized before crowning, and on the other that it is absolutely necessary to preserve the pulp at any cost.

It is not safe to be guided by either of these extreme opinions. A happy medium is the safest course, using good judgment and carefully studying each case. It is true that in some cases where a vital tooth is crowned, if it has been necessary to cut away a good deal of the tooth-structure the shock due to the grinding and the irritation caused by the irritative action of the cement on the dentin may be so great as to endanger the health or the life of the pulp. It is known that it may cause pulpstones, and the death of the pulp is apt to result in alveolar abscess. These results, however, are not always due to the fact that the pulp was not removed, or to the irritating action of the cement, but by poorly articulated work, improperly prepared teeth and roots, and poorly fitted bands, causing gingival irritation which may react on the pulp.

When cementing a bridge in the mouth, the action of the cement on the dentin is sometimes peculiar and unac-

counted for, so far as the knowledge of the writer goes. Where much of the tooth-structure has been ground away, leaving the tooth very sensitive, it will ache very badly when thoroughly dried, previous to setting the bridge or crown. The application of the piece with the cement frequently causes such excruciating pain as to be almost unbearable for a time, but it will gradually subside, until in about fifteen minutes it is not much more than a dull ache, although the tooth may continue to be uncomfortable for some hours. In another mouth, where the conditions are seemingly exactly the same, the teeth being equally sensitive and aching as badly when dried, when the piece is cemented in place the pain will cease instantly and the mouth be perfectly comfortable.

What chemical or physiological action takes place remains to be discovered, but it is certain that the action of the cement on the tooth-structure in one mouth may be directly the opposite from what it will be in another.

An experience of fifteen years seems to show that there is very little, if any, difference in the efficiency of vital or devitalized teeth in doing the work of supporting crowns or bridges, providing the teeth are properly prepared and the bands are accurately fitted. These last are the most important considerations.

In the case of a very young subject, where the roots are not fully developed and the apical foramen is enlarged, it would not be advisable to devitalize unless there has been so much irritation as to render it absolutely necessary. With a very elderly patient, where through the formation of secondary dentin the pulp has become practically obliterated, it would not be necessary, unless the canal was needed in which to place a pin in order to give additional support to the piece.

Where a tooth is not sensitive, or only slightly so, or decayed and broken down so as to require very little cutting, and it can be properly prepared with very little inconvenience to the patient, it is

perhaps advisable to preserve the pulp. If there are deep cavities which are sensitive after being excavated, they should be given a coating of cavitine or other insulating varnish, or filled with some non-irritating, non-conducting material, so that there will be no irritation to the pulp.

Where the position or shape of the tooth is such as to render it necessary to do a great deal of cutting, and the tooth is very sensitive, it would be cruel, to say the least, to expect the patient to undergo the torture which would necessarily accompany its proper preparation. It would be advisable to devitalize such a tooth and the roots should be filled at the same sitting. The different methods of doing this will be taken up in another chapter.

A loose tooth will often become firm in its socket if the pulp is removed, and in the case of one which is to be used as an abutment for a bridge, it would always be well to devitalize it. In many instances this will effect a speedy and perfect cure where scaling and treating have no effect.

Suppose where a vital tooth has been crowned, at some future time trouble does arise which results in the death of the pulp; the condition is then no worse than at the beginning. The tooth can be treated in the same way as any other tooth and there is no necessity for removing the bridge or crown. An opening can be made through the cusps, the pulp removed, and the canals filled. The bulk of the cavity can then be filled with any suitable material, such as gutta-percha or cement, and the balance with gold, which will make the crown as good as though it had never been cut at all.

To sum up, there are certain constitutional, temperamental, and local conditions which would render devitalization necessary in one patient and not in another. The dentist must make his own diagnosis and settle the question for himself in accordance with the conditions presented by the individual case.

(To be continued.)

THE STATUS OF THE DENTAL PROFESSION.

By MATTHEW H. CRYER, D.D.S., M.D.

(Abstract of the presidential address delivered at the meeting of the Pennsylvania State Dental Society, Bedford Springs, July 8, 1902.)

THE subject to which I desire to invite your attention is a topic of great interest at the present time, and one the merits of which have never yet been settled,—the status of our profession. In both America and Europe the question has been largely discussed as to whether dentistry shall be known as a specialty of medicine—demanding that its members obtain the M.D. degree—or whether it shall be a separate profession.

In England both sides of the question have been ably supported; recently the strongest argument has seemed to be with the latter position. Dentistry has always been taught in that country in connection with medicine, and the General Council of Medical Education and Registration of the United Kingdom has had supervision of the registration of dentists. Until recently the dentists have not even had representation in the General Medical Council. Yet there would appear to be a growth of sentiment among thinking men toward separation if we are to judge from some of the speeches made last summer at the International Dental Federation meeting held at Cambridge University. Long quotations could be made from these speeches, but as they have been published in the DENTAL COSMOS and other journals, I shall cite only two brief excerpts, from Sir Michael Foster and Dr. Jos. Griffiths.

Sir Michael Foster said: "At the present time you will find the university (Cambridge), like other seats of learning and education, busy with the question, What is the best kind of education for each profession and pursuit?—a question which is also stirring you. All, I venture to think, are agreed that education should be fashioned after the manner of a cone, starting from a broad basis and narrowing to an apex,—for it

is the conical bullet that has the penetrating power. In the storm and stress of modern life an all-round education may be good in society, but it is not suited to a profession. The round ball thrown at a surface *may* make a hole, but it more frequently simply rebounds, whereas the cone may be depended upon to pierce; and the man whose education is conical makes his way. For each profession the cone should be different, should be fashioned in different ways, though in each case it should start from the same broad basis, namely, the broad basis of the school—that is, the boy's school. . . . All knowledge is useful, but the power of the human mind to attain and retain knowledge is limited. We cannot all know everything. The surgeon need not, and if he excel greatly in his art cannot, know all the minutiae of the physician's calling; he cannot at once be an accomplished surgeon and complete master of all the details of auscultation and the intricacies of neural pathology. In like manner the dentist, if he is to excel in his art, cannot hope to know all that a physician must know and the surgeon must know."

Dr. Griffiths said in part: "Now, I believe I am correct in making the following statement,—that the dentists are divided among themselves as to the best means to adopt whereby they themselves can be best educated; and broadly speaking they are divided into two sections. To both sections, however, the desire to produce the best dentist is common, and each section naturally thinks it has found the right way. So far as I am able to gather and understand, this difference between the two sections may be explained in the following manner: One section requires that every dentist shall be trained as is a medical man, and then take up dentistry; whereas the other

section desires that a dentist shall be trained to his own profession from first to last. Can this education of a dentist be carried on side by side with that of a medical man? is the question of practical importance. I would unhesitatingly answer, No. The anatomist may train either, but he cannot train both without giving one much more than he requires and not giving enough attention to the other. It is much the same with physiology. Therefore, I say, their courses should be separate and so arranged as to serve the right end. In physics and chemistry the same training might serve; in the study of diseases, No. Although dentistry was once an intimate part of the medical art, it can hardly be so again, for its evolution has been so complete that it now forms a distinct and separate division of the art of healing. It is, I venture to think, a child of the old stock destined to continue an independent existence and to work out its own salvation."

DENTISTRY A SEPARATE PROFESSION.

In this country, when one considers the origin of the profession, it seems plain that we are surely entitled to our own degree, and the generally recognized honorable position it should give us. Dentistry in America did not originate from medicine. Scientific dentistry began here as a separate profession in specially established schools. In its infancy it was ignored by the medical profession, and had to found its own colleges and libraries and supply its own teachers, etc. I think it can be looked upon as a separate profession from the day the degree of Doctor of Dental Surgery was conferred upon Drs. Arthur and Mackall in 1841.

Of late years there has been considerable effort to bring the dental and medical professions closer together, in the hope of a final coalition, or rather of the absorption of the former by the latter as a specialty. With this movement I have no sympathy. We have a separate degree, the D.D.S., and consequently are a separate profession. The signs of the times indicate in no uncertain voice that

just in proportion to the more liberal education of the laity and of the medical and dental professions, the recognition of the truth grows that these professions are two, and that each requires teaching and training peculiar to itself. If dentistry be allowed to become simply a specialty of medicine, then the dental profession will cease to exist. This I sincerely hope will never occur. To prevent it we must continue to elevate the dental profession step by step, as the medical and other professions are being elevated. We have made wonderful advancement—no other profession has made greater strides—but the question now arises, How can we continue that advancement? For one thing, we can hold out inducements for the young men who have the foundation of a good all-round education. This is a necessity to the dentist as well as to any other professional man, and other things being equal the man with the better education will outstrip his less fortunate fellows.

But the possession of the educational qualifications is not the only necessity for the dentist. Many men having this foundation who would become eminent in another profession might make a complete failure in dentistry, because of their lack of mechanical ability. Years ago one of our best known teachers of dentistry, who has since retired from practice, had a private student in dentistry who showed no mechanical ability whatever, though he had all the necessary preliminary education. The professor, noticing this lack of mechanical aptness, advised him to give up dentistry and study medicine, which he did, eventually becoming one of the leading men of that profession.

ITS OPPORTUNITIES.

As inducements for young men having the necessary qualifications to turn their attention to dentistry, we can cite the facts in its favor. It is a young, vigorous, and growing profession. The need for dental services becomes more and more evident and the demand more pronounced as popular knowledge of the principles of right living increases.

There is therefore little danger of its becoming overcrowded in the near future. For those who bring to the practice of dentistry the proper faculties, the rewards are probably as great as in other walks of life. There are high honors to be won and substantial emoluments to be garnered. Then, again, the dentist's social position is as assured as that of any other professional man. Modern science has so improved the dentist's environment that it is no longer to be reckoned among the occupations which shorten life. Too many men pass forty, fifty, or more years in active work for that stigma to remain. There is no question but that the honorable practice of stomatology offers a pathway to a position of respect and influence in the community.

There are dentists who are always solicitous for medical recognition. It has been my experience that when they do anything worthy, the medical profession and others are quick to recognize and commend it. Without the assistance of this class of dentists the city of Philadelphia has recognized the dental profession by having four dentists as oral surgeons placed on the staff and medical board of the Philadelphia Hospital. At the city's expense dental laboratories and operating rooms have been fitted up in the hospital, which has two resident dentists. The dental staff and the dental residents are received on equal terms with all others connected with the hospital. The appended report for the year ending May 1, 1902, will give an idea of what is being done in the dental department of the Philadelphia Hospital.

Those who regard medical recognition as a necessity would have dentistry taught as a specialty of medicine, which would require the taking up by the dental students of branches composing the courses in general medicine many of which would be as useless to the dentist as a course in metallurgy or crown and bridge work would be to the medical student. It is true that education of any kind is useful to a man, but for the dental student to take up all that is or

should be required at our medical schools would be worse than useless. There are twenty-four professors from whom the medical students receive their instruction in the University of Pennsylvania medical course; to require the intending dentist to go through all these courses would be an almost criminal waste of his time and opportunities. In this day of specialization the man who soonest takes up and most thoroughly masters his particular special work is the one who succeeds best and who does the most good.

In the preliminary work of the medical and dental professions, students may be taught the elementary branches of anatomy, chemistry, histology, physiology, bacteriology, pathology, and materia medica, by the same teachers and at the same time. It matters but little whether the professors have the degree of M.D. or D.D.S., or no degree at all; their ability to teach and make the students interested in their work is all that is required. After students have received their elementary or general knowledge of the healing art, they should pass to the practical teachers for training in their special professions.

THE PARTING OF THE WAYS.

Here medicine and dentistry come to the forks of the road. The same teacher cannot teach the special branches of these two professions. The medical student must study surgical anatomy from the practicing general surgeon's point of view, and in the same way the other branches of medicine must be taught by men who are engaged in the actual practice of their special line. The students of the dental profession require teachers who are in actual practice or who spend the greater portion of their time in the clinic rooms of the colleges to instruct the students in their practical dental work, not only as to the filling and treatment of teeth and the making of prosthetic appliances, but in dental and oral anatomy, dental chemistry, dental histology, dental bacteriology, dental pathology, and dental materia medica.

REPORT—DEPARTMENT OF ORAL SURGERY,
PHILADELPHIA HOSPITAL.

The following is a summary of the work done in the Department of Oral Surgery, Philadelphia Hospital, from March 1, 1901, to May 1, 1902:

Total number of patients presenting themselves for dental and oral surgical services, 1808.

1193 Roots extracted

912 Teeth extracted

Total extractions, 2105

384 Fillings, temporary and permanent

43 Full dentures

21 Partial dentures

3 Interdental splints

49 Porcelain inlays

161 Administrations gas

29 " ethyl chlorid

17 " ether

11 " cocain

4 Simple fracture of mandible, successfully reduced

1 Compound fracture of mandible, successfully reduced

1 Double fracture of mandible, successfully reduced

1 Compound fracture of mandible, discharged without result, as the patient refused treatment

1 Dislocation of mandible, left side, successfully reduced

1 Chronic neuralgia cured by removal of infra-orbital nerve

2 Ankylosis (false), successfully treated

38 Alveolar abscess, successfully treated

17 Abrasion, treated

3 Canker sores, successfully treated

2 Difficult eruption of third molar, successfully treated

31 Devitalized pulps, successfully treated

2 Epulis, successfully treated

4 Erosion, treated

4 Fungoid pulps, treated

10 Fistula, successfully treated

4 Facial neuralgia, successfully treated

29 Marginal gingivitis, successfully treated

16 Specific gingivitis, successfully treated

2 Glossitis, successfully treated

1 Hypercementosis, successfully treated

7 Necrosis of mandible, successfully treated

14 Pericementitis, acute, successfully treated

2 Pericementitis, chronic, successfully treated

9 Pericementitis, traumatic, successfully treated

20 Pulpitis, successfully treated

23 Pulp-exposures, successfully treated

9 Putrescent pulps, successfully treated

2 Pulp-stones, successfully treated

71 Pyorrhea alveolaris, treated

5 Perforated roots, successfully treated

1 Scorbutus, successfully treated

301 Salivary calculus, successfully treated

16 Sen itive dentin, successfully treated

7 Stomatitis, ulcerative, successfully treated

58 Stomatitis, mercurial, successfully treated

19 Stomatitis, smokers', successfully treated

1 Sebaceous cyst, successfully treated

1 Epithelioma of maxilla, removed

1 Fibro-lipoma, removed successfully

2 Ankyloglossia, successfully treated

1 Fracture of alveolus, treated

1 Hypertrophied gum, successfully treated

There have been 32 public clinics held by the dental chiefs, with an average attendance of 93.6 students. Clinics given as follows: March 9, 16, 23, and 30, 1901, Dr. M. H. Cryer; April 6, Dr. Thos. Stellwagon, Jr.; April 13 and 20, Dr. M. H. Cryer; April 27 and May 4, Dr. Thos. Stellwagon, Jr.; October 5, 12, 19, 26, and November 2, 9, 16, and 23, Dr. M. H. Cryer; November 30 (no clinic); December 7, 14, 21, 1901, and January 11, 18, and 25, 1902, Dr. R. H. Nones; February 1, 8, 15, March 1, 8, 15, 22, and April 5 and 12, Dr. M. H. Cryer.

REMARKS.

Red stain. It has been suggested by someone that the peculiar red stain which appears upon the teeth of some people indicates predisposition to insanity, and that it denotes hereditary tendencies of that character. I have been interested to observe the mouths and to gather data in cases that have come under my care, and have made an examination of over 500 inmates of the department for the insane with the view of substantiating the supposition or disproving it.

In all I have found 71 cases of marked red stain; of these 54 were male, 17 female, and of the whole number only 8 were insane. Most of the patients were neurasthenics. Of the 63 hospital cases, none gave any family history of insanity. Attempts to grow cultures in any medium failed. Microscopic preparations present a picture similar in character to that of the green stain, and the enamel is softened under it. It is recurrent. Thoroughly removing it from the teeth does not stop the stain from reappearing.

Decayed molars in the insane. In a recent number of the *Dental Brief* there appeared a short paragraph in which someone asserted that badly decayed teeth, particularly the molars, were the cause of more people becoming insane than anything else. This is not so. I have, since reading the above, taken particular interest in examining the teeth of the insane and comparing the conditions found with those of inmates of the hospital side of this institution. While the mouths are equally unclean, I think that, taken as a whole, the inmates of the insane department have better teeth than have the hospital patients.

In the matter of suffering pain insane people are analgesic.

Pyorrhea alveolaris. I have found fewer cases of pyorrhea alveolaris among the inmates of this institution than I expected. Such cases as have come under my observation were of long standing, and every manner of treatment before extraction has been tried, but without result other than making the patients' breath less offensive.

Mercurial stomatitis. Excellent opportunity for studying this condition is found in the venereal wards of the hospital. Briefly stated, my observations in regard to this form of malady are as follows:

That in almost every instance where patients are sent to me to have the mouth examined and cared for before specific treat-

ment is commenced the stomatitis has not appeared.

That in many cases where the malady has already developed it readily responds to proper treatment.

The method of procedure in all instances is to thoroughly clean the teeth, remove all decaying roots, fill all cavities, and see that there are no rough edges to irritate the tongue, and that the patient keeps the mouth and teeth clean. Order mouth-wash, astringent. I have found that a five per cent. solution of potassium permanganate gives the best results in cases where the malady has developed. Sig., 3 t. d.

Respectfully submitted,

W. DAVID EASTON,
Resident Dental Surgeon.

AN ANSWER TO DR. WEDELSTAEDT.

By R. H. HOFHEINZ, D.D.S., Rochester, N. Y.

IN the December number of the *Cosmos* appeared an article by Dr. Wedelstaedt, in reply to a paper on "Extension for Prevention" which I had read at the New York State Dental Society meeting at Albany, and which appeared in the September 1902 issue of the *DENTAL COSMOS*.

I felt quite honored to think that a gentleman of such distinction, a gentleman who evidently represents all that is scientific and cultured in a northwestern dental sense, should have spent so much time in replying to my article.

After carefully reading his reply I came to the conclusion that, aside from the fault he finds with my language, which he has attacked in a polemic style, he criticized but a few minor points of my paper. Otherwise he has done practically nothing but regale the readers of the *Cosmos* with a repetition of what he has said again and again in articles in the *Items of Interest*, *Dental Review*, etc.

I will confine myself to the reply of Dr. Wedelstaedt only as far as it concerns me and my paper, not being able to write another essay on "Extension for Prevention" at present. I will take up each point as it appears in sequence in the doctor's paper:

(1) I really don't know why Dr. Wedelstaedt takes such pains to explain his own *conservative* view on the question of "extension for prevention." I have nowhere in my own paper mentioned his name, and the entire effort smacks decidedly of the French proverb, "Qui s'excuse, s'accuse"—which for the benefit of some readers I may translate into my own humble English: "Who excuses himself, accuses himself."

(2) Dr. Wedelstaedt accuses me of not understanding the followers of Dr. Black. He says: "If he does not compare his knowledge with that of others, he has only vague ideas regarding the knowledge these others may possess of a subject which he may feel he knows all about. . . . Did he go out among these men . . . ?" I can assure Dr. Wedelstaedt that I have been out once or twice. I have not traveled between Chicago and St. Paul quite as frequently as has Dr. Wedelstaedt. I also frankly confess that I have never dwelt in Owatonna nor at West Superior, of which the doctor speaks as representative spots of northwestern dental culture. This is necessarily an educational crime for which I hope to atone at some future day. I have traveled over many

thousand miles per land and per sea, and though I have not always noised my presence at dental meetings I believe I have inspected things in and out of dentistry with open eyes.

(3) Dr. Wedelstaedt offers to pay my expenses if I journey to Owatonna and West Superior and fail to acknowledge the great skill of the gentlemen he quotes. Why should the doctor's modesty prevent him from including St. Paul, his own home, the very place I ought to visit to gain the apostolic wisdom I so sadly need. If my numerous duties would permit, I should avail myself of such a rare chance. Such opportunities are like soups—they must be taken hot or they spoil.

I don't dare offer Dr. Wedelstaedt the same—he might possibly accuse me of plagiarism—but I make the following proposition: Let three dentists known to the profession as conservative men and rational thinkers visit the University of Buffalo Dental Department, and also the city of Rochester. If the majority does not agree that I have well understood the meaning of Dr. Black's theory, and have applied that grand man's teachings in a correct and rational way, I will give five hundred dollars to the fund which the New York State Society started at its last meeting for the advancement of dental science. I am not in favor of rattling with the money-bag to prove things, but I cannot well let Dr. Wedelstaedt's great liberality stand alone in dental history.

(4) Dr. Wedelstaedt now repeats what he has told the profession once or twice before, namely, that the "small" approximal fillings in bicuspid are less permanent than the large ones, and he finishes this paragraph by saying, "All this I stated many years ago, and all men of intelligence know how true it is."

If Dr. Wedelstaedt will refer to the beginning of his answer he will find that he himself quoted from *my* paper, which reads: "There can be no question in the mind of any intelligent and observing operator that the large approximal gold fillings have a greater longevity than the smaller ones under precisely the

same conditions." Why should Dr. Wedelstaedt have found it necessary to fill fifty lines of his answer with this already plainly stated truism? He certainly loves to see himself in print, as some are similarly fond of the music of their own voices—a virtue shared in common with many other great men.

(5) The next paragraph deals with a general view regarding the enlargement of cavities for "extension for prevention," with special reference to the microbic plaques, the only scientific viewpoint from which the doctor discusses the subject.

It is impossible to admire the work which Drs. Williams and Black have accomplished in this respect, and in others, more than I do. Germans are all given more or less to hero-worship. I am, however, not blind therein. The question of acid production by bacteria *in situ*, microbic plaques, as the only factor of enamel decay, is not settled.

I refer Dr. Wedelstaedt to a paper written by Dr. W. D. Miller (*Cosmos*, 1902, page 425). I quote these sentences from the paper: "I am not quite convinced that the nature of this film has been determined with sufficient clearness, or whether its significance and importance may not have been somewhat overrated. In the first place, I am at a loss to know just how the conclusion has been arrived at that these plaques are of a gelatinous nature, or that they are in any way 'glued' to the surface of the tooth. . . . On the whole, the question as to whether bacterial films secrete a viscous substance of any kind . . . needs looking into more carefully than has hitherto been done. At present no real evidence, as far as I am aware, has been produced in favor of it."

I sincerely hope that Dr. Wedelstaedt considers Dr. W. D. Miller of some authority on the subject, though I doubt from all I know personally of Professor Miller that he belongs to that class which Dr. Wedelstaedt has modestly termed "the men of advanced methods of the northwest." Goethe says of authority: "The fact that a thing has already been done, said, or decided has a high value,

but only a formalist asks for authority to help him to a decision in all possible cases."

(6) Dr. Wedelstaedt wishes to know what I mean by "a cavity of one millimeter which is to be extended into one of seven by five (gingivally)."

It seems to me that if the question of "extension for prevention" is under consideration one can only mean a "cavity extended and prepared for filling." The initial penetration is not at all under consideration. An approximal cavity to be extended upon so-called immune areas is naturally extended gingivo-occlusally and bucco-lingually. The seven millimeters, therefore, can only refer to the gingivo-occlusal extension, the five millimeters referring to the bucco-lingual extension at the gingival line of the cavity. I meant (and could only mean) the natural cavity artificially extended for decay-preventive purposes.

I grant that I might have made this point more explicit. I read my paper, however, to men who I had every reason to assume knew what I meant by the extension of an approximal bicuspid cavity for the prevention of recurrence of decay. When I lecture to my classes in college, I naturally give the minutest description possible.

(7) Dr. Wedelstaedt has now reached a point of undisputed superiority. He assailed my language as "ambiguous" and of the kind of which he "cannot make head or tail." I bow before him in humble submission, and present to him with envious feeling a laurel wreath for his linguistic superiority. If I had had the good fortune to have been born in the classic northwest of the U. S. A., instead of Heidelberg, I should cross swords with him also on this point. I humbly, however, take a back seat, and say to Dr. Wedelstaedt, in the language of Mrs. Malaprop, "You go ahead and I precede you."

Two questions of some importance have entered my mind in connection with the ambiguity of my language:

(a) How was it possible for such men as Drs. Jarvie, Ottolengui, Rhein, Head, Sanger, and others to discuss my paper

with intelligence if they had not understood it? I always thought them men of clear conception, and not one of them would have hesitated to tell me that they did not understand what I meant by my ambiguous language.

(b) If Dr. Wedelstaedt was able to write an answer to a paper of which he "could not make head or tail," and thus fill nearly seven pages of the *DENTAL COSMOS*, what would he not have accomplished in the line of quantity if my language had conveyed to him a proper and concise meaning? I am afraid I have deprived dental literature of many immortal pages on the advanced method of the northwest, and I do not know how to atone for it except by asking the profession's pardon for my nativity—in which, however, I had no choice—and by saying, with David Harum, "If I said anything I am sorry for, I am willing to be forgiven."

(8) Dr. Wedelstaedt wishes my evidence for the following sentence: "He (referring to Dr. Black) has, however, nowhere requested us to cut a cavity of one or two millimeters into one of five or six to prevent recurrence of decay, regardless of conditions, as some of his followers have done."

It would have been better if I had omitted the last seven words, thus saving some writing and unnecessary reference. As long as Dr. Wedelstaedt has accepted my paper as a criticism of his own teachings, I have no alternative but to quote from his writings only. Such quotations as—

"I have all along contended that where permanent work was to be made, the cavity margin must be extended fully two-thirds the thickness of the tooth." (*Items of Interest*, 1901, page 356.)

"The advocates of 'extension for prevention' have no set rules beyond the fact that when permanent work is to be made, the cause which led to the first decay must be fully removed." (*Ibid.*, page 347.)

"It is only through the gingival extension of the cavity margin beneath the gum septum that security is given to a filling." (*Ibid.*, page 349.)

"The dentist cuts farthest who cuts far enough. . . . Cutting far enough means that cavity margins must be extended into zones where the conditions of the first decay are so completely removed," etc. (*Dental Review*, 1901, page 776.)

These instructions can mean nothing else but what I have stated. If they do, I have misunderstood Dr. Wedelstaedt as he has misunderstood my essay.

The fact remains that a great many dentists in the east have thoroughly understood Dr. Black's teachings, but they are impressed by the further fact that some of his enthusiastic followers have gone to an unreasonable extreme in regard to "extension for prevention." I was one of the gentlemen thus impressed, and it was while still under this impression that my paper was read in Albany. I have nowhere accused Dr. Wedelstaedt as the main cause of this understanding, but when he made it a personal question I had no alternative but to do the same.

I assume, and with reason, that a man who believes (*Items of Interest*, 1901, page 352) that fillings which have remained intact for forty years had to be removed because they were not extended—which would have preserved them for all time—may be a prophet, but he must also be an unreasoning enthusiast and therefore an unsafe teacher.

I assume also that a man eighty per cent. of whose practice consists of removing other people's fillings (*Dental Review*, 1901, page 777) might find that fifty per cent. thereof could be indefinitely preserved by conservative repairing.

And I assume further that a gentleman who claims for Chicago (*Ibid.*, page 774) that within ten years it will be everywhere recognized as the center of academic education of the world is a man of great and no doubt thoroughly honest enthusiasm, but a man whose vision is somewhat impaired by that stimulating but dangerous attribute. I gladly grant that nothing is so important to some people as their opinion, yet it seems

superfluous to me to repeat such opinion too often.

Nowhere in my paper have I attacked "extension for prevention." The gentlemen who know my work and my teaching know well how I apply its meaning. It was against *indiscriminate methods* of "extension for prevention" that I wrote my paper. It is this point which Dr. Wedelstaedt has failed to understand, and, as someone expressed it, "It seems as if Dr. Wedelstaedt had written his answer to accommodate his misunderstanding."

Criticism is the best stimulus to healthy development. If Dr. Wedelstaedt found it necessary to criticize my views on "extension for prevention," he certainly would have found it an easy task if he had taken up the subject according to my classification:

- (1) Environments with special reference to the oral fluids.
- (2) Age of the patient.
- (3) Prophylaxis.
- (4) Enamel rods and their relation to the cavity margins.
- (5) Esthetics.

Instead of that he has taken from my essay a few sentences, which he "could not make head or tail of," and made a few caustic remarks about them. He used a few absolutely irrelevant comparisons from surgery, and clothed himself with one scientific garment, the "microbic plaques," which garment, on close inspection, showed serious imperfections.

He also ascended to the moral aspect of "extension for prevention."

The moral side of any question is justice. Just criticism must be welcome to any clear and honest thinker. Such criticism as Dr. Wedelstaedt has regaled us with may be interesting to some readers, but only because it carries enough personal allusion to make it amusing. Its intellectual and moral influence, however, is equal to nought, and its impression upon the minds of careful readers will pass away like the breath of the camel in the desert.

DO WE USE THE ALL-GOLD SHELL CROWN TOO MUCH?

By F. A. BALLACHEY, D.D.S., Buffalo, N. Y.

(Read before the thirty-fourth annual union convention of the Seventh and Eighth District Dental Societies of the State of New York, Buffalo, October 28, 1902.)

IT is our privilege from time to time to meet together for the interchanging of ideas and opinions on matters relating to the profession which we follow, and by hearing new things and discussing old ones we get the corners rubbed off of our own ways of doing things, and learn not to be too "cast-iron" in any method of practice. If each of us delivered himself of just one idea at a dental convention, he would get in return the ideas of all the other members, and would therefore be very much the gainer. It is with this thought in mind that I have come before you at this time with but a single idea. It cannot be a new one, for it must surely have voiced itself deep in the heart of everyone present, but I think it will not be amiss to bring it to the light of criticism and discussion and let the cleansing rays of publicity play upon it for a few minutes. You have a suggestion of what it is in the title, "Do We Use the All-Gold Shell Crown Too Much?"

The method of saving teeth when nothing but the roots are left, by means of a gold crown, was first suggested by Dr. Beers, who settled in California about 1849. He had his invention patented in 1873, after he had been using it for some years. He died in the following year, so that the matter was not brought before the profession as much as it might have been, until a few years later. This invention was a wonderful stride forward, because the preservation and restoration to usefulness of teeth which had nothing left except the roots must have seemed, before that, an utter impossibility. But if there were great possibilities for good in the new invention there were also great possibilities for evil, and many good teeth were needlessly covered up by gold caps.

SOME EXTREME CASES.

When I was a student, a few years ago, a friend of mine was having some work done at a dentist's, and one evening it chanced that I was called upon to stop the aching of one of her teeth. It was an upper second bicuspid and had a good large cavity in it. The buccal and lingual sides were both good, but (would you believe it?) that tooth had been flattened off preparatory to crowning. The pulp had not been devitalized, though probably it was the intention of the operator to devitalize it before crowning. But think of the case: A beautiful pearly tooth disfigured in that manner, in order to be covered up by an all-gold shell! Of course the tooth should have been filled and not crowned.

Last spring a patient whom I was treating had had several gold caps on the lower teeth. One of these had been removed some time subsequent to the crowning operation. The tooth thus exposed was almost intact, and the patient informed me that the other crowns covered teeth fully as good. The crowning in this case had been done as a cure for pyorrhea alveolaris, and the dentist who did the work had informed the patient that she would have no more trouble with those teeth in any way. If the patient remains under my care, I think it probable that some more of those shell crowns will follow the fate which the first one met.

It not infrequently happens that we have to remove cap crowns for the purpose of treating chronic alveolar abscesses, and where I have had to do this it almost invariably exposes a tooth which could have been and *should have been* saved by filling. I removed one only a short time ago and do not intend to put it on again, partly because it doesn't fit anyhow, and partly because I

can make the tooth useful and comfortable by filling it. I believe it would be safe to say that hundreds,—yes, thousands,—of teeth have been needlessly covered with shell crowns since the introduction of this system; and not only that, but they have been *actually ruined* by crowning, whereas they should have been preserved in wholesomeness and beauty by filling. I am not referring now to the all-gold cap on anterior teeth—there is no shadow of excuse for that under any consideration—but am speaking of the posterior teeth, the molars and possibly second bicuspid which are presented having from one-quarter to two-thirds of their substance lost by caries. And remember, I am not running down the system, but am deprecating the *abuse* of the system. The all-gold shell crown is a good thing; it is a grand thing to be able to make an old root almost as good as it ever was; but to take a tooth which might be filled and cover it up in such a way is an abuse. It should not be done.

I assert, then, that we have used and still do use the all-gold shell crown too much. *A tooth which it is possible to fill well should not be crowned.* I will give two reasons for this statement, though of

course there are many others. First: Nearly all crowns cause a little irritation to the gingivæ. Second: Crowning is a last resort. If you fill a tooth and the filling breaks out, then you can crown it, but you will have the satisfaction of knowing that you didn't crown it until you had to. Besides that, it is wonderful how these large fillings will stay in and do good service for years.

THE COMMERCIAL FACTOR.

It is my private opinion that commercialism has been a large factor in bringing about the too frequent use of shell crowns. It is so much easier to cement on a gold cap and pocket a comfortable fee than to toil over a large and difficult filling for a lesser remuneration. The individual conscience of the operator must settle this question in all cases, but, gentlemen, let us remember that there is a higher aim in the practice of a profession than the amount of wealth to be accumulated, and a better reward than the almighty dollar.

There you have my idea, and if the telling of it is resultant in the saving of one tooth from an unnecessary gold cap it will not have been in vain.

SEPARATION AND RESTORATION OF CONTACT, INSTEAD OF RADICAL EXTENSION FOR PREVENTION.

By W. J. WORSLEY, D.D.S., Dixon, Ill.

OF late there have been printed in the several dental journals a number of articles by different writers, for and against the practice of so-called "extension for prevention" in those cases where the approximal surfaces of teeth have been affected by caries.

While, in the several articles referred to, good reasons have been advanced both for and against this practice, it seems to me that some of the writers have almost if not entirely overlooked what I believe to be a more important factor in the prevention of recurrent caries, upon approximal surfaces of the teeth, than

any form of extension for prevention. I refer to adequate separation and *complete* restoration of the contact point.

With the normal space restored between the surfaces of the teeth approaching each other, a much less radical extension will suffice to bring the cavity margins upon self-cleansing areas. Having the additional space in which to manipulate the material, the average operator will be enabled to place a filling with a much greater degree of certainty that the margins will be perfectly tight when the final polish has been given. It also gives while polishing much better

access to the parts requiring most attention,—namely, the gingival margin and the contact point.

I have seen many fillings, otherwise practically perfect, which from lack of sufficient space between the teeth were finished in such a manner as to leave the contact point nearly flat. As a natural result, the gum septum was forced away so that it had nearly disappeared, owing to the impaction of food particles between the teeth, and the constant pressure resulting therefrom. This unhealthy condition of the tissues occupying the interproximal space can have but one result,—that of favoring the conditions under which a recurrence of decay occurs. This applies especially to the gingival margin.

APPROXIMAL CONTACT AND CONTOUR.

I can see no valid reason, providing the margins are perfect, why caries should attack the surface of a tooth approaching a filling, *whether extended to a self-cleansing area or not*, any sooner than a corresponding area upon the surface of the approximating tooth the surrounding conditions affecting which remain unchanged.

The fact that caries has affected one and not the other tends to show that it is often a result of structural imperfection, rather than environment. If not, why are not the surfaces of both teeth affected similarly? It is true that in some instances they are, but not always. Of course, the difference in time in the period of eruption may to a certain extent change or modify this seeming immunity of some teeth. However, many instances are seen in which the distal surface of a second bicuspid is affected while the first molar approximating it is perfectly sound, though it must have passed through all the period or periods of susceptibility to which the bicuspid has been exposed, as well as those of several years before the bicuspid erupted.

Surely no operator, be he ever so radical, who has the best interests of his patient in view, would advocate the cutting of cavities upon perfectly sound surfaces of teeth, simply because caries

might attack them; neither would he, in every case, cut the margins to the extreme limit of extension for prevention for a similar reason. In other words, he must exercise judgment, consider the age of his patient, bodily condition, and apparent condition of the teeth as regards susceptibility and immunity, etc.

There are patients who present themselves for treatment whose teeth are apparently so susceptible to the ravages of caries that our best efforts are of questionable value. I have not found, however, that filled teeth, even in such cases, were any more prone to decay than others in the same mouth, providing the normal space and contact were restored and margins above suspicion, *whether extended or not*.

Some will say that if we were always sure of perfect margins, the cases in which recurrent decay would occur would be comparatively few. To this nearly all will agree; but, with no better margins, the tooth with a full or even slightly exaggerated contact point and interproximal space, with moderate extension, stands a much greater probability of resisting decay than its neighbor with full extension and lack of interproximal space, and of necessity a flat contact, and puny, unhealthy gum septum—to make no mention of the effect on the approximating tooth.

METHODS OF SEPARATING.

As to means taken to secure the necessary separation, I believe that when operating upon molars and bicuspid slow separation is desirable, especially if considerable space must be gained. This may be accomplished by the use of base-plate gutta-percha, wooden wedges, or rubber separating strips, whichever is most effective in the hands of the individual operator; while with the incisors, generally, some form of separating instrument will be found to be more desirable. This also applies when but a slight amount of extra space is necessary when operating upon bicuspid and molars.

I find that if the necessity for separation is explained to them, most patients will willingly submit to the necessary

pain and inconvenience occasioned by the operation.

This article has not been written for the purpose of discouraging a reasonable extension upon approximal surfaces, but it seems to the writer that if adequate

separation be obtained before the operation of placing a filling is attempted, the practice of extension for prevention, in order to be effective, would not require the sacrifice of so great an amount of sound tooth-structure.

BLEACHING TEETH.

By **HERBERT C. MILLER, Portland, Ore.**

(Read at the fifteenth annual meeting of the Washington State Dental Society, at Tacoma, Wash., May 24, 1902.)

WHEN we consider the subject of bleaching teeth we must assume that the pulps of these teeth are dead, and that—

(1) The change in color, or the discoloration, is due to pigment resulting from decomposition or changes taking place in the pulp tissues and the substance within the tubuli of the dentin, or

(2) The introduction of foreign matter into the interior of the tooth, which either stains the contents of the dentinal tubuli directly, or by the decomposition or changes taking place in the foreign matter either the dentinal tubuli or their contents are stained.

The stains that are found in discolored teeth are within the tubuli, or the discoloring substances stain what the tubuli may contain, or they stain the substance that cements the tubuli together.

Teeth so affected may change in color through all the various shades from pinkish to yellow, or brown or grayish, blue or black, almost all shades.

Some teeth are so hopelessly discolored or so stained and mutilated that it is useless to spend any time trying to bleach them, because it is impossible to do this sufficiently well to have them retain their bleached appearance after they are filled. The crowns of such teeth had better be replaced by artificial ones.

AVOIDANCE OF INFECTION.

When we make an opening into a tooth the pulp of which is dead and in

which there has been no external opening, we must be certain that nothing is permitted to enter that contains micro-organisms, any oil, or anything containing coloring matter that can be infiltrated into the dentin of the tooth.

There is a legend concerning the Emperor of China in which he is reported to have in his employ four hundred learned doctors, and so long as "his majesty" enjoys good health his physicians receive full pay; but should the emperor become ill the salaries of these physicians stop, and they are in danger of being beheaded.

It is much easier to prevent teeth from becoming discolored than it is to bleach some of them after they have become discolored.

Having determined that it is worth our while to try bleaching operations, the first thing to consider is the cause of the staining or discoloration. After determining this we must decide how to bleach it and how to maintain the color after the tooth is bleached.

If the tooth has been stained by a metal filling containing either silver or copper, or from the use of an essential oil containing a gum resin, we will have to employ different methods than those made use of to bleach a tooth discolored by blood-stains, decomposed pulp, food, tobacco, saliva, etc.

We must now assume that all of the preliminaries in the way of opening the tooth, removal of all débris, treatment and filling of root-canals with something

that gases from bleaching materials will not penetrate, have been attended to.

Let us first consider that class of cases which is the most frequent, those due, viz, to blood-pigment, decomposed pulp, food, etc.

MODE OF PROCEDURE.

(a) Apply the rubber dam and remove as much of the discolored dentin as can be removed without weakening the tooth too much, wash the interior, and dry with hot air.

(b) Dissolve the coloring matter, and then wash it out. This may be accomplished—

First: By the use of twenty-five per cent. pyrozone. Apply upon clean cotton, lint, or bibulous paper, to the interior of the tooth or to any surface that is to be bleached. Use hot air upon the pyrozone, or a hot instrument, which not only causes the more rapid decomposition and liberation of oxygen, but also steams the tooth, which seems to hasten the process of bleaching. Pyrozone may also be placed in a tooth upon cotton or lint and sealed with gutta-percha and left from one to three days. A small vent may be made through the gutta-percha.

Second: Introduce dry powdered potassa alum into the tooth or pulp-chamber; then apply upon cotton or lint a freshly made Labarraque's solution of chlorinated soda; quite an agitation will take place and chlorin will escape. It is not the chlorin that does the bleaching, but the nascent oxygen that is liberated by the action of the chlorin on the water molecule, which oxidizes and makes the coloring matter soluble so that it can be washed out.

Third: Introduce aluminum chlorid (chemically pure, dead white) into the tooth; then apply fresh Labarraque's solution of chlorinated soda, liberating nascent oxygen, which renders the coloring matter soluble in the same manner as in the other processes.

We may also substitute a five per cent. solution of hydrogen dioxid for the Labarraque's solution.

Fourth: Wipe out or moisten the in-

terior of the tooth with a chemically pure six or eight per cent. solution of sulfuric acid. Then introduce sodium dioxid, dry, into the tooth and it will be broken up at once, and the volumes of oxygen that are liberated attack the coloring matter and render it soluble, so that the dissolved matter can subsequently be washed out, which completes the process.

(c) Having dissolved the coloring matter, wash it out. This is really very important. We cannot have permanent success unless the coloring matter is gotten rid of. For this purpose use distilled water. I prefer water that has been re-distilled. We may also wash with a solution of biborate of soda or a solution of bicarbonate of soda, one-half of one per cent. Wash out the interior of the tooth thoroughly, and then wash it some more, and when you think the dissolved coloring matter is all out, then wash it again.

(d) Dry the tooth and fill the interior with zinc oxychlorid or oxyphosphate of an appropriate color, or use zinc oxysulfate reinforced with zinc oxyphosphate. If the wall of the tooth is so thin that there is danger of the cement showing through and making a white spot, we can overcome this tendency by first introducing some dead-white paraffin into the interior of the tooth; then take a hot instrument and go over the interior of the tooth and paraffin it, which will prevent the cement from showing through.

The quickest way to bleach a tooth that I know of, when it has not been discolored by alloys, copper, amalgam, essential oils or gum resins, is by using aluminum chlorid and Labarraque's solution.

The next is by using powdered alum and moistening with Labarraque's solution.

And the next is by moistening the interior of the tooth with dilute sulfuric acid and then filling-in sodium dioxid; and last but not least is the twenty-five per cent. pyrozone method.

METALLIC STAINS.

To bleach a tooth discolored by an alloy or an amalgam containing copper:

Remove all the old filling and decay, if there be any, and clean out the interior of the pulp-chamber.

Get all of the mechanical staining from the tooth that you can without unnecessarily weakening it.

Apply the rubber dam. Wash the interior of the tooth first with alcohol until the whole tooth is saturated; then dry it and wash with a dilute solution of ammonia or with chloroform. (It must be understood that the root-canals have previously been filled.) Dry thoroughly with hot air, and apply a dilute solution two to two and one-half per cent. of potassium cyanid on a pellet of cotton. Use a wooden, bone, or ivory instrument to make the application.

Allow the application to remain five to ten minutes; then remove carefully and wash the cavity with a dilute solution of chemically pure acetic acid. Repeat this application three or four times if necessary.

All these methods of bleaching referred to, except the sodium dioxid, are facilitated by previously washing the cavity with a dilute solution of aqua ammoniæ.

In all of the operations for bleaching, I prefer if possible to complete the work the same day. To accomplish this, all of the preliminaries should be done at previous sittings.

Pure terebene ($C_{10}H_{16}$) will slowly dissolve the oils. It should be sealed in the tooth and the application renewed once a week.

LATE COMERS.

By A. E. PRESTON, D.D.S., Delevan, N. Y.

(Read at the thirty-fourth annual union convention of the Seventh and Eighth District Dental Societies of the State of New York, Buffalo, October 28, 1902.)

A BANKING firm were hard pressed. A shipment of gold was ordered, which, if they received it in time, would keep them solvent. The last day arrived, also the ship, but the gold was not there. It came by the next boat, but was too late, and the firm was forced to the wall.

The governor had put his signature to the pardon of one who was condemned to be hung. A courier was sent out. He arrived just after the drop had fallen, and a human life was extinguished.

A railway engineer's watch was five minutes behind time. He met a train upon the same track. The result was many lives lost.

The battle of Waterloo was on. Napoleon was anxiously looking for reinforcements. They came just too late to

save the day, and one of the world's greatest generals spent the remainder of his life in exile.

These with other incidents which discoursed upon the evils arising from being behind time were in the Reader which I, as a boy, used in school. Although the subject of being behind time is an old story, it is ever new. Every day as we take up the paper we read accounts of someone's carelessness in this respect and the loss and misery arising therefrom, until we are convinced that nearly one-half of the troubles of life arise from the fact that someone failed to do the right thing at the right time.

A patient fails to keep an appointment with the dentist, causing annoyance and loss to both parties. A dentist fails to have a certain piece of work done at a

promised time. Perhaps both parties lose their tempers and the doctor his patient.

When you write a paper for the dental society, you fail to send in a copy to the one who is to open the discussion until the last moment and he has a chance to give it only a hasty going over. The society therefore loses the best part of the paper, which is usually in the discussion.

Thus it has ever been that people or things that are always behind time have caused a great deal of trouble and annoyance.

DELAYED ERUPTION.

But it was not of these in general that I started out to speak, but of a few "late comers" in the shape of late erupting teeth that I have met with in my practice. Not that the cases I shall mention are any different from those of other practitioners, but they are mentioned because they were interesting to me and may serve to remind you of some that you have seen.

The first case of delayed eruption to which I was introduced was in my preceptor's office. An upper denture had been worn for several years by a gentleman who was then about sixty-five years of age. He came into the office complaining of a soreness of the gums under his plate in the region of the incisors. He told the doctor he thought there was a piece of bone coming through the gum. Upon examination my preceptor found not bone but sound enamel, and at once told the gentleman he had a new tooth coming, and jokingly remarked that if he lived long enough he might get a whole new set. Between them they decided to extract the "late comer," and after a hard struggle a full-grown canine over an inch in length and lying horizontally in the jaw was brought to light.

A case similar was brought to my attention only a few days ago by a lady of sixty who came to my office to interview me, anent the subject of an upper denture. She had a few scattered teeth which she was willing to lose, but what

bothered her most was the fact that she was cutting a new tooth. On examination I found an upper right canine nearly half erupted in the place of the right central which had been removed some time before.

Now, if you see fit to discuss this subject, I would like to know your ideas as to whether the germs of these teeth lay dormant for fifty years or whether they were fully grown and only waiting for a favorable opportunity to make their *début* into society.

I will next cite two cases of delayed eruption of the canines in persons of eighteen years of age. The first: A young gentleman wished me to examine his teeth, and upon so doing I found an almost perfect set. In fact, I found only one small cavity of decay in an upper first molar. Upon closer examination, I found that the upper right canine was a temporary tooth. The patient said that at times the tooth became sore and loosened. At the second visit this temporary canine was sore and quite a little loose, and I advised extraction, saying that I had no doubt that the permanent tooth was erupting and crowding upon its predecessor. I extracted the tooth. It was five years ago. We are still looking for the permanent canine to erupt.

The other case in this connection was a young lady who at eighteen years of age presented a temporary upper canine with a small cavity of decay. All the other permanent teeth were in place, excepting the third molars. I advised filling the cavity and keeping the tooth as long as possible, being a little suspicious on account of my former experience. Filling the tooth answered well for a time, but finally it became so loosened that we had to extract it, and found, upon so doing, that the point of the permanent canine was in sight. It has been very slow in erupting, but now at twenty it is nearly full length, but just a little twisted. These two cases were identical in the treatment but exactly opposite in the results.

I have a patient, a girl of sixteen, whose temporary second molars are all

in place but one, and they are as sound and perfect as ever. The other permanent teeth are all in place and the occlusion is fair. The question in my mind is, Where are the second bicuspid? Will they ever exert their authority and shove their predecessors out?

THE THIRD MOLARS.

Now, of course, we all realize that the "late comer" that gives us the most trouble is the third molar, which, in accordance with some of the theories advanced and generally aired at the Falls meeting this summer, our descendants will not be bothered with for many generations more. However, at the present time this same third molar is of a great deal of importance as a member of the tooth family on whom you can place no dependence. You never know when he is going to turn up, what he intends to do while he stays with you, or just how long he intends to remain.

I have a patient, a gentleman who is afflicted with pyorrhea. When he first fell into my hands he wore a plate with one upper central incisor. During the past seven years I have treated the re-

maining teeth,—the patient losing two or three a year,—adding to and remodeling his plates until at the present time he has only three of his natural teeth remaining. At the age of fifty-seven he came to the office one day with the upper right second molar in a highly sensitive condition, with badly swollen, purple gums. I treated the tooth in the usual way by removing all the calculus I could find and cleaning the pockets. This usually gave relief for a time, but in this case the tooth would not yield to the treatment and it was extracted at a later sitting. In a few days the patient returned to inquire of me if I had gotten all of the tooth out. I made an examination, and, lo and behold! a perfectly formed third molar was erupting, pure and white as a baby's tooth, at fifty-seven years of age!

Five years later, exactly the same condition of affairs was found on the other side of the mouth, and a fully developed third molar was the result, at sixty-two years of age. The lower third molars have never put in an appearance, and the question in my mind is, Will they yet do so, if the patient lives to a good ripe old age?

CORRESPONDENCE.

CHEMISTRY OF TOOTH-DISCOLORATION.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In your December issue there appears a review of a paper which I read before the Odontographic Society of this city and which was published in the October 1902 number of the *Dental Review*. I desire to call your attention to a former paper which I read before the same society, and which was published by the same journal in its June 1901 issue. By referring to that paper you will find an explanation of certain phases not con-

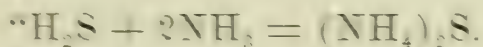
sidered in the paper you reviewed,—it being stated in the introduction of my second paper that it was a continuation of the first.

My opinion as to "the rôle played by hydrogen sulfid in the discoloration of teeth" is fully explained in the June 1901 number of the *Dental Review*, page 507. To quote:

"That you may be able to follow a chemical theory which I am about to advance, I would have you note the rela-

tive amount of nitrogen. N. compared with sulfur, S. found in proteid substances.—the former being 15 to 17, while the latter is 0.3 to 2. Notwithstanding that perhaps some of the nitrogen is utilized in forming oxids of this element, we cannot doubt that, in the decomposition of the pulp tissue, ammonia, NH_3 , a compound of nitrogen and hydrogen, is far in excess of hydrogen sulfid, H_2S , a compound of hydrogen and sulfur, both however being active chemical agents. Our laboratory experience teaches us that ammonia unites chemically with water, forming ammonium hydroxid. $\text{NH}_3 + \text{H}_2\text{O} = \text{NH}_4\text{OH}$, and this reagent will readily precipitate the salts of iron in both the ferrous and ferric forms, producing respectively ferrous and ferric hydroxid, $\text{Fe}(\text{OH})_2$ and $\text{Fe}_2(\text{OH})_6$. The former, a greenish-white substance, readily absorbs oxygen when in the moist state, and changes to the latter, a reddish-brown substance.

"Since ammonia is far in excess of hydrogen sulfid in the by-products formed in the decomposition of the pulp, and has the property of uniting chemically with water, which is always present, forming a reagent (ammonium hydroxid) that will always precipitate the salts of iron, would it not be more plausible to attribute the discoloration of a tooth from this cause largely to the formation of ferric hydroxid rather than ferrous sulfid? But admitting, for the sake of argument, that ferrous sulfid causes the discoloration, it can only be formed by the hydrogen sulfid acting on the ammonia, producing ammonium sulfid. $(\text{NH}_4)_2\text{S}$:

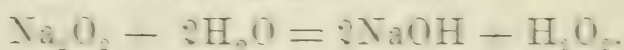


"This *alkaline* reagent will always precipitate the salts of iron, and in all likelihood a small amount of ferrous sulfid is produced in this way.

"My conclusion, then, is that the discoloration is due in all probability to the formation of ferric hydroxid and ferrous sulfid, both being dark substances and formed according to the reactions above explained. The ferric hydroxid, as mentioned before, is a reddish-brown sub-

stance, and when mixed with only a small amount of black ferrous sulfid it makes a mixture of dark appearance—in fact, almost black in color."

The equation $\text{Na}_2\text{O}_2 + \text{H}_2\text{O} = 2\text{NaOH} + \text{H}_2\text{O}_2$ has been stated to be "absolutely incorrect as a chemical possibility; for, in the compounds the result of said reaction, there are found two atoms of hydrogen more than were present originally." The reviewer can also find in the equation, as published, one atom of oxygen—or, in all (two atoms of hydrogen and one of oxygen), one molecule of water, H_2O . All that is necessary, then, to make the reaction "chemically possible" to the reviewer is to balance the equation by taking *two* molecules of water. This was done in my manuscript, but omitted by the proofreader. The same equation is correctly published in my first paper, *Dental Review*, page 510, thus:



This same equation can be found in most standard works on chemistry which treat of sodium dioxid. (See Newth, "Inorganic Chemistry," 5th ed., page 487.)

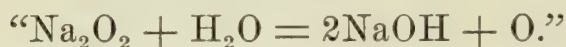
The possibility of making a solution of sodium dioxid is fully considered on pages 510, 511. To quote:

"Chemically considered, a solution of sodium dioxid in water cannot be made, any more than can a solution of sodium chlorid be made in sulfuric acid. None of us would attempt the latter, thinking the result would be a solution of common salt. Water is a positive and instantaneous decomposer of sodium dioxid. That is to say, they act chemically upon each other, and the result of this chemical action depends solely on the way in which the powder has been added to the water. If added slowly and cautiously, as Dr. Clark recommends, the water unites with the sodium dioxid, forming a solution of sodium hydroxid and hydrogen dioxid:



"This, as stated above, is a valuable solution. The hydrogen dioxid will bring about the bleaching and sterilizing, while the sodium hydroxid is a valuable

adjunct, as will be shown later. Should the sodium dioxid be added to the water without any precaution being taken to retain the oxygen in solution, a somewhat different reaction takes place. As before, the water unites with the sodium dioxid, forming sodium hydroxid, but liberating oxygen, which contains appreciable quantities of ozone, O_3 :



In answer to the question, "Why would it not be better to directly use hydrogen dioxid?" I refer the reviewer to pages 511-513. To quote:

"When the dry powder is placed in the cavity or pulp-chamber of the tooth and comes in contact with organic tissue, which always contains water, or if moistened with water in any way, the sodium dioxid is at once decomposed and sodium hydroxid and ozonized oxygen are the products of the decomposition, as above explained. The latter oxidizes the coloring matter as in the other methods of bleaching, but performs its work more energetically, while the by-product, sodium hydroxid, instead of coagulating the partially decomposed or semi-putrid substance within the tubuli, causing a mechanical obstruction, saponifies the fats and allied tissue, forming a soap which is soluble and can with care be washed out of the tubuli with hot water, mechanically bringing with it the insoluble oxidized coloring material." (Page 511.)

"Were it not for this product, sodium dioxid would have no advantage over hydrogen dioxid, pyrozone, hydrozone, or any of the prepared oxidizing solutions." (Page 513.)

"No doubt you have noticed in this article the reference to the 'mechanical' removal of the oxidized coloring material. If our deductions be true, the coloring substances are ferric hydroxid and ferrous sulfid. The action of ozonized oxygen on the latter, FeS , would produce ferrous sulphate, FeSO_4 , a soluble salt and easily removed. But the action of ozonized oxygen on ferric hydroxid would produce ferric oxid, Fe_2O_3 , an insoluble compound, and if removed

by water it must be done mechanically." (Page 512.)

I feel that this explanation should appear in your journal in justice to myself, as only part of my work on this subject has been reviewed and a reaction has been branded as "absolutely incorrect" and "chemically impossible" on no other ground than a typographical error, which error would be of no consequence to anyone with a rudimentary knowledge of chemistry.

Sincerely yours,

J. P. BUCKLEY.

CHICAGO, Dec. 16, 1902.

[In the foregoing critique by Dr. Buckley of our review of his article on Tooth-bleaching, the matters at issue resolve themselves into the following points involving a difference of opinion:

Dr. Buckley argues that in decomposition of the pulp, because there is an excess of nitrogen in the proteid elements, ammonia as an end-product is produced in quantities more than sufficient to form ammonium sulfid with all of the hydrogen sulfid produced, and that because of the excess of ammonium hydroxid thus produced the iron which is a constituent of the hemoglobin will be precipitated, at least partially, as ferrous or ferric hydroxid instead of wholly as sulfid. This is an ingenious line of reasoning, but not in accordance with the observed facts, for the reason that even in hemoglobin itself there is an amount of sulfur present which when converted into hydrogen sulfid or ammonium sulfid is more than sufficient to convert all of the iron of the hemoglobin into iron sulfid, and every analytical chemist knows that a mixture of ammonium sulfid and ammonium hydroxid when added to a solution containing a soluble salt of iron will precipitate iron as sulfid even in the presence of the free ammonium hydroxid whenever there is sufficient ammonium sulfid to combine with all of the iron present.

Now, these are precisely the conditions which result even from the decomposition of hemoglobin alone, there being more than sufficient sulfur present in hemoglobin to combine with all of its contained iron, but in the process of pulp-decomposition we have an abundant excess of hydrogen sulfid present from the decomposition of the proteid elements of the tissues themselves, so that the

production of free ferrous or ferric hydroxid in the circumstances under consideration is extremely improbable.

The problem at issue is one which concerns not the relations of the nitrogen and sulfur compounds, but the ratio of the sulfur to the iron present; and that ratio is, as we have already stated, such as to furnish more than the necessary amount of sulfur to ultimately convert all of the iron of the hemoglobin into iron sulfid.

Dr. Buckley states dogmatically that it is impossible to make an aqueous solution of sodium dioxid. Indeed, he goes so far as to state that "a solution of sodium dioxid in water cannot be made, any more than can a solution of sodium chlorid be made in sulfuric acid." We quote, as opposed to that view, the following from a "Treatise on Chemistry," by Roscoe and Schorlemmer, vol. ii, pt. 1, page 109: "The [sodium] dioxid is not decomposed on heating; when thrown into water, heat is evolved and caustic soda and oxygen are formed; if the water be added gradually the dioxid dissolves, and this solution if allowed to evaporate spontaneously deposits large tabular hexagonal crystals of the hydrate, $\text{Na}_2\text{O}_2 + 8\text{H}_2\text{O}$, and these when dried over oil of vitriol lose three-fourths of their water, giving rise to a second hydrate, $\text{Na}_2\text{O}_2 + 2\text{H}_2\text{O}$."

The question, then, as to whether we get a solution of sodium dioxid, or a solution of caustic soda with the evolution of oxygen, or a solution of sodium dioxid plus some hydro-

gen dioxid and some free oxygen, all depends upon the manner in which the solution is made; and we prefer to have better evidence to the contrary than is furnished by the unsupported statement of Dr. Buckley that it is chemically impossible to make a solution of sodium dioxid. And, further, his statement that "ozonized oxygen" is one of the products of decomposition produced by the action of sodium dioxid when applied as dry powder to the moistened contents of a pulp-chamber, is a statement which also seems to need verification.

We frankly admit that Dr. Buckley may have had access to literature on this subject which we have not seen, but we would recommend to him—First, a careful consideration of the literature upon the subject of the serial decomposition of hemoglobin and the variety of pigmentations which its decomposition products produce, and which have been carefully studied. Second, a thorough investigation of the literature on sodium dioxid and its properties, and possibly some precise laboratory experimentation in the production of sodium dioxid solutions under special precautions for preventing the elevation of temperature during the manufacture of the solution.

We have every reason to admire the judicial quality of Dr. Buckley's chemical reasoning, but his difficulty from our point of view appears to be that he has not reckoned with all of the factors involved in his problem.—
ED. COSMOS.]

A CORRECTION FROM DR. LINE.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Several of your contemporaries are publishing extracts from my little effort as published on page 740 of your July 1902 issue, errors and all; in fact, they seem to give preference to the error parts (because of the hidden meaning, perhaps!).

The DENTAL COSMOS, of course, was not to blame in the matter, but the fellow who buried the proof that you sent

me, until several weeks after the issue of the number in question.

"There are others," but these will stand correction: On page 740, ninth line from bottom, read "formative, vegetative." On page 741, third line from end of paper, read "structural degeneration and rupture of the vessels."

Very truly yours,

J. EDW. LINE.

ROCHESTER, N. Y., Dec. 16, 1902.

PROCEEDINGS OF SOCIETIES.

INTERNATIONAL DENTAL FEDERATION AND INTERNATIONAL COMMISSION OF EDUCATION.

Joint General Meeting of the International Dental Federation and International Commission of Education with the American Dental Society of Europe, Stockholm, Sweden, August 16 to August 19, 1902.

(Continued from page 49.)

SATURDAY, AUGUST 16TH.

THIS session of the Federation was called to order by Professor Lindström.

Dr. A. W. HARLAN. Mr. President and Gentlemen: Very unexpectedly I am called upon to say something concerning the object of our meeting here to-day. You will expect from the number who have come from the United States, a long distance, that we are much interested in the object of the International Dental Federation. It seems but a short time ago that a little body of men in Paris gathered together and gave forth the idea that there should be an International Dental Congress. From the moment the idea was broached I cordially and heartily supported it. My *confrères*, many of whom are present to-day, were most earnest in support of the idea of an International Federation, and Professor Brophy and Professor Barrett, and other members interested who are not here to-day, were amongst the first supporters. Out of that little congress, numbering only a few hundred, at which were present hardly a baker's dozen from the United States, grew the great and successful Columbian Dental Congress in Chicago in 1893. It is not so long ago that any of you will have forgotten the splendid assemblage from countries to the number of twenty-seven who participated in that Congress. After the successful termination of that congress and the publication of its proceedings the congresses were stamped as a success by the profession of the whole world, and when it was intimated, in consequence of the projection of a uni-

versal exhibition in Paris in 1900, that another congress was desired, the whole professional dental world to a man gave it support, and before the termination of that Congress the wise men there gathered decided that the interest and enthusiasm excited by the Congress should be further continued by cementing all countries into an International Dental Federation, to concern itself with the teaching of dentistry and to make it as nearly uniform as possible.

It was in consequence of that movement in Paris in 1900 that we had the eminently successful meeting in London and Cambridge last year. The success of that meeting was due, I might say, almost wholly to the single efforts of one of our number on the Executive Council, Dr. Cunningham of Cambridge. Without his invaluable assistance and foresight we would not have had the successful termination of such a large meeting. Its proceedings have been published in all languages and sent everywhere, and to-day, in consequence of the enthusiasm that was spread abroad, the colleges and institutions of learning and societies throughout the world have contributed delegates to be present in this far northern city of Europe, showing by their presence that they are willing to support us, and showing also that they have the one principal central idea, the betterment of the profession and its further universal, international advancement. I thank you for the opportunity of saying these few words, and I hope the deliberations of the Congress will be as successful as have been those of previous years.

Mr. W. E. HARDING (president of the British Dental Association). I have very great pleasure in rising to say a few words on behalf of the English dentists and the British Dental Association, of which I have the pleasure and honor of being president this year. That we are very few in number at this international gathering I think must be in a great measure put down to the apprehension that many of my *confrères* have of the inhospitality of the North Sea,—not the inhospitality we should meet here, but that the crossing might be somewhat “lumpy.” It is the first occasion on which I have attended a gathering of the International Dental Federation, and, seeing the enthusiasm of the many countries that are represented here, I feel sure that the outcome must be for good. Dentistry, like science, is of no nation, no politics, and no country.

Amongst the subjects for discussion I see there are several of very great interest. The subject of state dentistry is but now awakening, and we are only on the threshold of what it will be in the not remote future. There are many directions in which the state ought to help us and we the state—if the state will but allow us. I am sure that a gathering like this must help on the good work. Meeting together and rubbing shoulders takes off the angles and points of friction between us, and leads to fraternization which must be of great benefit to our science and our calling. I thank you for the patience with which you have listened to me, and the reception you have given to the English members of this Congress, and I hope that the meeting will be for the good of the profession.

Dr. J. FRANK, Austria. I have the honor of presenting to you the greetings of the organized body of dentists of Austria and Hungary. Appreciating the importance of the questions on our program, they have asked me to convey to you their thanks for the disinterested work in which you are engaged for the benefit of the profession at large. Full of hope, they are awaiting the results of this work. I feel happy to be the bearer

of these expressions of confraternal feeling from the Austro-Hungarian dentists.

Dr. SMITH HOUSKIN. As a delegate of the Norwegian Dental Association I bring a greeting from the Norwegian dentists. We live in a country which to many present may seem to lie far up in the north, away from the great centers of culture, but thanks to the excellent communications of the present day we feel ourselves not so far away after all. Every summer we see in our country great numbers of travelers from south, east, and west, many of whom are fond of coming back. But we do not feel ourselves fully satisfied by only seeing visitors in our country from abroad. No! Norwegians from the days of the Vikings to the present moment have had longings for foreign lands themselves. Even as the Vikings of old brought to the country precious treasures—as for instance the finer culture and Christianity of England, France, and Ireland—so travel the Norwegians in the present day, and not in the least the Norwegian dentists, to find the wealth and treasure of knowledge and science. From the greater centers there ever blow into our land the fresh winds of a higher culture, and without denying our nationality we take to ourselves all that brings the spirit of man and mankind a step nearer the ideal.

We, therefore, value the international energy of science. For this reason the Norwegian Dental Association looked with interest on the work of the International Dental Federation, and it is the association's great pleasure to get the opportunity of connecting itself with this important society. The pleasure is all the greater as our first meeting with the Federation is here in Stockholm where we have at the same time an opportunity of meeting so many of our honored Swedish colleagues and friends. We have great expectations of the Federation and its work, for, in the first place, it is by taking up such important questions as dental education and public dental hygiene that we are enabled to reach the greater dental interests, and secondly, because at our head stand men of talent

and skill. The energetic president, Dr. Godon, and the untiring secretary, Dr. Sauvez, we all know for their colossal work in connection with the Paris Congress. With the hope that such gentlemen will always stand as the leaders of the Federation, we wish a successful result to the Congress.

Dr. WEBER (Helsingfors, Finland). On behalf of the Finnish Dental Society I speak to you now, and I do so with profound feeling. When I think of so large a society with such great men, and between them the little ones, I am overwhelmed. We can all see the great men, but not the little ones; but if for a moment you can observe the little ones, I thank you for that. I am happy that you have recognized me, and further am happy to be the representative of a country from which, though it is not a large one, I bring you greetings. I hold in my hand a document, signed by the vice-president and secretary of the Finnish Dental Society, in which the society presents its greetings and expresses its gratitude for the recognition which has been shown to Finland, and expresses the hope that the Federation will be the means of cementing together the delegates from all countries, including that of Finland.

Mr. MORRISON (Australia). I have been called upon equally unexpectedly with others who have spoken before me to address to you a few words. As one of the representatives of an institution which is still in its infancy, I do not think it would be proper to occupy too much of your time, but I may say that the Australian College of Dentistry, although perhaps in its swaddling-clothes, possesses a constitution which is a very robust one. I might also say that the dentists in Australia are doing their best to maintain the dignity of their profession, and to attain a high educational standard. I feel with my co-delegate, Mr. Bain, that our mission here carries with it a great deal of responsibility, but we are amply compensated by knowing that it also bears with it a corresponding high degree of honor. As one of the representatives of a dental institution

which is perhaps the leading one of its kind in Australia, I have only to add my thanks for the privilege of being permitted to address to you these few words, and to express a confident assurance that the results of this conference will bear very good fruit in far-off Australia.

Dr. GULDBERG (Norway). As president of the Commission of Examinations and as Norwegian delegate on the question of dental education, I have the honor of offering you our respectful greetings and best wishes for the success of this important meeting. Dentistry, as is the case with many other institutions of learning in our country, is a recently organized branch of learning, and thanks to its rapid progress and to the earnest efforts of all interested in this specialty we hope soon to attain our purpose. We are happy to form a part of this distinguished assembly to which so many important men bring their valuable contributions. I beg you, Mr. President, to accept our best wishes for the success of these important meetings.

Dr. W. E. ROYCE (president of the American Dental Society of Europe). I am pleased to say that the American Dental Society of Europe is very much more ably represented than the delegates which have been appointed to this meeting, but I hope they will not feel I trespass upon their domain if I simply say that that society fully appreciates, possibly more than those who have gained their experience in any one country can appreciate, the importance of the questions which have prompted the promotion of this organization. We most heartily wish for the Federation a long and a successful future.

Addresses were also made by Dr. Frick of Switzerland, Dr. Artaud of France, Dr. Guerini of Italy, and Professor Ehrbehr.

Dr. SAUVEZ (secretary) read the list of the delegates to the Federation meeting.

Dr. Godon then introduced Dr. Brophy, president of the International Commission of Education, to the meeting, and Dr. Brophy took the chair.

INTERNATIONAL COMMISSION OF EDUCATION.

President BROPHY then introduced Professor Lindström, as a man whose name was co-extensive with medicine and whose teaching in anatomy was known throughout the world.

Professor LINDSTRÖM. I have the honor of submitting, at the request of the Swedish delegates to the International Commission of Education, the following short report on the three questions submitted to the consideration of the several delegates by the said Commission:

REPORT OF DR. LINDSTRÖM (SWEDEN) ON THE THREE QUESTIONS PROPOSED.

When the Royal Caroline Institute was entrusted by our government with the organization of dental education in this country, namely, the theoretical and practical studies necessary for the education of dentists, we had to solve to the best of our abilities exactly the same questions as are submitted to our discussion by the International Commission of Education.

The first of these questions is framed as follows: "What should be the preliminary requirements for admission into dental schools?" There is only one answer to this question, viz, that if dentistry is accepted as a true specialty of the healing art, the dental candidate should be required to possess the same preliminary education as that required of the medical student. The answer to the third and last question, which reads, "What part of the studies that are taught in medical schools should be pursued by the dental student?" must be in harmony with the opinion expressed with regard to the first question. It is very plain that the same series of subjects should be studied by the dentist and by the physician, but as the study of medicine in this country requires from nine to ten years, the greater part of which is devoted to the theoretical branches, and as the commission entrusted with the organization of dental education had been asked to limit the length of the course to three years, it became impossible to arrange a plan of studies based upon a common education for both the dentist and the physician.

Following these principles, we organized our dental education five years ago. The curriculum is so arranged that the course is completed in three years. The curriculum embraces a theoretical course during the first year and a practical one during the second and third. Last year some preliminary work on prosthetic technics was introduced in the first year with very satisfactory results. The theoretical course is given by the professors

of the medical school, and the practical course is given in a dental clinic especially organized for this purpose and in laboratories of operative dentistry and dental prosthesis, by teachers attached to these institutions.

The theoretical course embraces the following subjects: (1) Chemistry, Metallurgy, and Materia Medica; (2) Anatomy, Histology and Embryology; (3) Physiology and Medical Physics; (4) General Pathology and Bacteriology.

The subjects of the practical course are as follows: (1) Surgery; (2) Dental Surgery; (3) Obturations; (4) Dental Prosthesis and Orthopedia.

I will now endeavor to answer the other question proposed by the Commission of Education:

Answer. The first and second semesters are almost entirely devoted to the study of anatomy. The course is divided into two parts, dissection and microscopy. The program comprises general anatomy, systemic and topographic anatomy of the head and neck, special and comparative anatomy of the teeth and mouth; a general survey of the central nervous system and of the organization of the viscera. The course in histology includes general methods of technique, histology of the cells and tissues and special histology of the teeth and neighboring structures. In the course in embryology, a student takes up at the same time the general development of the organic system and the special development of the skull, face, and teeth. I attach a special degree of importance to the evolution of the maxillæ and the teeth after birth, during the period of development, and during senile atrophy. The study of chemistry comprises the most important features of inorganic and organic chemistry, especially in their relation to dentistry—metallurgy being included in this branch. The study of physiology refers to those parts which have a direct bearing upon the functions of the oral tissues. Materia medica is taken up in so far as it is related to dentistry. Toxicology, antiseptics, and general and local anesthetics are also included in this group. The course in physiology should comprise the most important points of medical physics and human physiology, especially the physiology of the buccal cavity and neighboring structures. The course in general pathology and bacteriology comprises the most important elements of general pathology and pathological anatomy, the more important phenomena of local changes in the circulation, and passive and active changes of tissues, and must be accompanied by demonstrations by means of anatomical preparations. The course also deals with the most important points in the science of micro-organisms and special mycology. After having passed the examinations in the subjects here enumerated, the students follow a course in surgery in the hospital during their second year. This course

comprises elements of general surgical pathology, diseases of the buccal cavity and neighboring structures, including diseases of the skin and syphilis and aberrations of development. In Sweden, the students, as a rule, take up the study of dentistry at the age of nineteen or twenty, and after studying three or four years, take the professional examination which confers upon them the right to practice. They enter upon the practice of their profession at an age where we may properly presume that they have a serious conception of their duties as practitioners of dentistry.

The PRESIDENT (Dr. Brophy). Before leaving home I caused the address that I am about to deliver, to be printed in French, German, and Swedish. On arriving at Stockholm I found that the Swedish translation was so very poor that it would be misleading, but the French and German are fairly good, though errors are to be found in both.

(Dr. Brophy's presidential address was printed at page 1221 of the December, 1902, issue of the DENTAL COSMOS.)

The report of Dr. Roy, the secretary-general of the International Commission of Education, was read in his absence by Professor Martinier, as follows:

REPORT OF DR. MAURICE ROY ON THE THREE QUESTIONS PROPOSED BY THE INTERNATIONAL COMMISSION OF EDUCATION.

The three propositions which I have the honor to submit to the International Commission of Education of the International Dental Federation in answer to the three questions set forth last year at our London-Cambridge session were first discussed and adopted by the Paris School of Dentistry, afterward by the commission of education of the National Dental Federation, and lastly by the whole French National Federation at their session of May 25, 1902. I have therefore the advantage of presenting the present report both in my own name and in that of the French National Dental Federation, which represents all the French dental associations, with the exception of two small provincial groups.

With respect to this I take the liberty of drawing your attention to an important point, which is that if, in their deliberations, the International Dental Federation would give, in addition to the personal opinion of their members, that of the national federation, it would afford a larger basis to the discussions of the international assembly. But for that purpose it would be necessary that national dental federations should be organized in every country—which, unfortunately, is not the case. For that reason it is desirable that the Executive Committee of the International Dental Federation should employ all

its influence to constitute national federations in all those countries that have representatives among us. It is also desirable that, on their side, these representatives should, each in his respective country, take the initiative in organizations that are so important for the future of the International Dental Federation and for the interests of those whom it proposes to champion.

First question—"What are the preliminary studies to be required of students before beginning their professional education?"

The necessity of a sufficient general education is admitted by everyone and I think it needless to insist thereon. What we have more particularly to consider is—(1) The extent of such general education; and (2) the age at which it should finish.

These two considerations are in reality absolutely inseparable. For if the question of age had not to be considered, there would be no reason why one should limit the general education of the dentist, the general culture of a man being never too great, no matter to what branch of human industry he may be called. But for the dentist a limiting consideration here interposes—that is, the necessity of his beginning at an early period of life the study of his profession properly so called. This point was made remarkably evident last year at Cambridge by our Philadelphia colleague, Dr. Kirk, and his opinion was supported by the then president, Sir Michael Foster, an eminent physiologist, who summed up in the following short proposition the ideas of our fellow member: "The mind ages slowly and can be educated at even a late period of life, but the body grows quickly old and it is necessary to train it while young."

For these reasons we think that the studies relating to general culture ought not to be prolonged beyond the age of sixteen; not that we think it necessary to commence dental studies at that age, but because we consider that the education of the future dentist should then assume a special character in order to prepare him progressively for dental studies properly so called, beginning thus the formation of the *cone of education* so admirably described by Sir Michael Foster.

What is to be the program of these studies of general culture? It will evidently be variable according to the country and the educational organization; it ought nevertheless to form a complete whole, quite homogeneous, allowing a youth of sixteen to have a general idea of the fundamental bases of human knowledge.

This being recognized as regards general culture, are the studies of the future student of dentistry to be confined solely to this general education, or are they to be already directed to the special object he has to pursue?

In order to solve this question, we must first put another, on the solution of which will depend the answer to the first: What qualifications are necessary to make a dentist?

Everybody has not the aptitudes necessary for a dentist, who should possess, besides an intelligence sufficient to assimilate the varied knowledge necessary for the study of our art, enough manual skill to acquire in that time the dexterity required in the execution of the diversified labors of operative dentistry and prosthesis.

Now, there are certain individuals who, though endowed with intelligence in every other respect, are naturally so awkward as to render them incapable of acquiring even medium skill in the practice of our art. It appears therefore necessary, according to the principle laid down by Mr. Cunningham, to make sure beforehand that the future student of dentistry possesses this indispensable minimum of manual skill. For this reason it would be advisable to require from the latter a general manual instruction that would enable one to form an opinion as to his aptitude and at the same time would cause him to acquire, from this point of view, the general principles the application of which he would meet with later on. It is also advisable that before entering upon his professional instruction the student of dentistry should possess general scientific notions sufficient to follow profitably the special courses of lectures, or otherwise these would have to be kept at too elementary a level.

It is to these two orders of instruction—gradual manual instruction on the one hand, general and elementary scientific instruction on the other—that the preliminary studies of the student of dentistry must be devoted from sixteen to eighteen, the normal age of admission to the school of dentistry. To these must be added the study of two living languages, the necessity of which has been felt at meetings like these we hold annually.

These different considerations have led us to propose to you to adopt, for the first question put by the International Dental Federation, the following answer, which is the reproduction of a wish expressed by the Congress of 1900:

The *preliminary education necessary* for the student of dentistry before being admitted to follow his professional education must comprise—

- (1) A literary education with a knowledge of two living languages.
- (2) An elementary knowledge of sciences.
- (3) Manual instruction.

On these different orders of instruction we cannot seek for better inspiration than in the remarkable words of Sir Michael Foster when he speaks of the general basis on which all special education must rest. The broad basis, he says, must be "the discipline of the school; that is, the boy's school. I say the discipline rather than the learning of the school, for the aim of the schoolmaster should be in all cases the formation of the mind,—the setting of the instrument, not the filling of the bottle. The growth of habits of accuracy, of intentness,

and of alertness, this rather than the gathering of mere knowledge of facts is the proper heritage of the school, and for the attainment of these habits it matters not so much what the boy is taught as how he is taught."

Second question — "In what are dental studies to consist, how long ought they to last, and what should be the order of the program?"

This question is incontestably the most important of all that can be put, for it places more particularly at variance the two principles which contend for the direction of dental studies—the odontologic principle and the stomatologic principle. It is not possible to discuss here these two theories; it has been done too widely to make it necessary to revert to them, and time would be lacking, as the subject is one that admits of long developments. Nevertheless, there are a certain number of points that must be settled, as they form the basis on which we must rely in order to solve the question stated above.

It is incontestable that a man's education is never too extensive; doubtless all knowledge is useful, but, as Sir Michael Foster in his address at Cambridge admirably remarks, "The power of the human mind to acquire and preserve knowledge is limited." On the other hand, the development of human knowledge is such that it is no longer possible for a man to be able, like Pic de la Mirandole, to descant *de omni scibili et quibusdam aliis* and that it becomes indispensable for a man to limit himself if he wants to acquire, not a superficial acquaintance but a profound knowledge of any branch of science whatsoever. As Dr. Godon remarks, quoting Herbert Spencer, in his excellent address at Cambridge, "We that have but span-long lives' must ever bear in mind our limited time for acquisition."

The question of how long studies ought to last is therefore of extreme importance, as argued last year by Dr. Godon and by myself in the discussions of the International Federation. Their duration must be perforce limited, and four or five years seems to be a maximum that cannot be exceeded. It would be impossible to require from dentists studies analogous to those of doctors of medicine, since it is impossible, as no one sufficiently acquainted with the facts will deny, in four or five years to make at once a doctor and a dentist. It is advisable therefore to make a rational use of the maximum time to be devoted to study, so as to allow of students of dentistry acquiring gradually the knowledge requisite for the exercise of their profession.

Dental studies come under two heads: on the one hand scientific and medical studies, on the other technical studies. How are they to be divided?

We consider it indispensable to give a very notable pre-eminence to technical studies, and particularly to practical work. Dental therapeutics and its two corollaries, operative den-

tistry and prosthesis, admit of a very important manual part, necessitating a long apprenticeship both of the eye and the hand, hence the necessity of devoting a considerable part of the hours allotted to study to practical work (prosthesis and operative dentistry).

According to the calculations made by Dr. Godon in his thesis and previously by myself in my report to the Congress of 1900, a proportion of one-fifth of the hours of study devoted to the scientific and medical part of dental instruction appears to be sufficient. We think therefore that this proportion may be accepted as a basis on which the program of this part of dental instruction should be established.

Is it desirable to divide the teaching as is done in certain foreign countries—in Switzerland, for instance, where one year is devoted to the study of physical and natural sciences, one year to medical studies, and a year and a half to dental studies? We are not of that opinion. We have already said that technical studies should be of long duration, particularly as regards practical work; now, in order that the student may profit by the latter, it is necessary that he should receive concurrently theoretical technical instruction without prejudice to general scientific and medical instruction. From the above facts the necessity follows of organizing different courses of lectures so that medical and scientific instruction and technical instruction may be given simultaneously. The distribution alone should differ; scientific and medical lectures should predominate in the first years and technical lectures in the last. All the courses of lectures, especially the technical ones, should naturally be graduated according to the years of study.

It is desirable that a particular regulation should be made applying to doctors of medicine who intend to practice dentistry; and conformably to the wish expressed by the Congress of 1900, it should be obligatory for this category of students to attend for two years the classes of a school of dentistry. It would, however, be necessary to draw up a program of practical work for these students so as to allow of their going gradually through the program of practical work which normally extends over four years.

These diverse considerations being settled, we propose to you to adopt the following answer to the second question above stated:

(1) Dental studies comprise a scientific and medical part, and a technical part.

(2) Their duration must be at least four years.

(3) These studies must be organized conformably to a parallel method for all the classes—scientific and medical instruction and technical instruction simultaneously.

(4) It must be obligatory on medical graduates who purpose practicing the art of dentistry to attend, for at least two years, the lectures of a school of dentistry.

Third question — “What branches of the studies taught in medical schools must the student of dentistry follow?”

After what we have just said on the preceding question, the answer to this last question does not admit of being extended. In the first place we reject completely, for reasons that have been often stated and of which a few are here recalled, the assimilation of dental studies to medical studies and consequently the obligation of complete medical studies in order to practice the art of dentistry.

Irrespective of this absolute view of the question, is there an advantage for students of dentistry to follow certain teachings given in schools of medicine? We think not. As we have already said in our report on instruction, if it be indispensable that the student of dentistry should have a knowledge of anatomy, physiology, chemistry, and physics, it is not indispensable that his knowledge of these subjects should be as extensive as if he were destined to practice medicine or to take a degree in physical sciences. In the faculties of medicine lectures are given with a view to medical studies; it follows therefore that students of dentistry having but a limited time to devote to them can profit only to a limited extent by lectures of a higher order than is strictly necessary for their later studies, or else, should they devote sufficient time to them, unless their studies be prolonged it must be to the detriment of their professional instruction.

I am happy to find that on this point my opinion coincides with that of a man of intellect, Dr. Joseph Griffiths, professor of surgery at the University of Cambridge. In the memorable session of the International Dental Federation at Cambridge Dr. Griffiths, after having compared the respective wants of the doctor and the dentist, said in his remarkable discourse: “Can this education of a dentist be carried on side by side with that of the medical men? is the question of practical importance. I would unhesitatingly answer, No. The anatomist may train either, but he cannot train both together without giving one much more than he requires and not paying enough attention to the other. It is much the same with physiology. Therefore, I say their courses should be separate, and so arranged as to serve the right end.”

The conclusion we arrive at is that if dental science is an autonomous science then dental instruction must be autonomous instruction.

There remain, however, two particular points to be examined: dissection on the one hand, medical and surgical clinics on the other.

As regards dissection, dental schools have a difficulty to contend with, namely, that of procuring corpses, many considerations interposing in many countries with respect to this. In countries where this difficulty exists it is absolutely necessary to have recourse to medi-

cal schools or to hospitals, but subject to one peremptory condition, namely, that lectures shall be given there exclusively for the use of dentists, the *locale* alone being changed, the spirit of the teaching remaining the same.

With respect to medical and surgical clinics the question is easier to solve. We must bear in mind that with very rare exceptions—and then they are generally assisted by the doctor in attendance—dentists have only to attend patients who are not confined to their beds. Consequently what they have an interest in seeing is patients coming and going like those who present themselves at the consultations for out-door patients. It is therefore easy to have a consultation room annexed to each school, in order to supply this want; but, in default of such a plan, it will be necessary to apply to the hospitals, bearing in mind, as for dissection, that the examination of patients is to be made strictly with a view to the special teaching to be followed by students of dentistry.

We therefore propose to you, in answer to the third question, to adopt the following resolution:

"All the studies of students of dentistry must take place exclusively in schools of dentistry, except that of dissection in cases where it is impossible to procure dead bodies, but subject to the condition that the lectures be given exclusively for the use of such students."

Such are the reasons which have led us to adopt the three resolutions which I have the honor to submit for the approval of the International Dental Federation in the name of the French National Dental Federation, which resolutions I reproduce as follows:

First resolution:

The preliminary education necessary for the student of dentistry before being admitted to follow his professional education must comprise—

- (1) A literary education with a knowledge of two living languages.
- (2) An elementary knowledge of sciences.
- (3) Manual instruction.

Second resolution:

(1) Dental studies comprise a scientific and medical part and a technical part.

(2) Their duration is at least four years.

(3) These studies must be organized conformably to a parallel method for all the classes: scientific and medical instruction and technical instruction simultaneously.

(4) It must be obligatory on medical graduates who purpose practicing the art of dentistry to attend, for at least two years, the lectures of a school of dentistry.

Third resolution:

All the studies of students of dentistry must take place exclusively in schools of dentistry, except that of dissection in cases where it is impossible to procure dead bodies, but subject to the condition that the lectures be given exclusively for the use of such students.

Dr. BOGUE wished to know whether the report had been printed in English?

Dr. GODON said that the committee by great efforts had had the reports put into English and printed, at some expense, and a copy had been sent to every member. There were very few remaining, and it was impossible to distribute them to all present.

Dr. HOLLY SMITH wished to have a discussion on Dr. Brophy's paper without any extraneous matter being introduced.

The PRESIDENT (Dr. Brophy) said he could clear up the whole matter by stating that the report read by the Secretary was in English in his hands, and it could be read in English if necessary.

Dr. W. C. BARRETT, Buffalo, U. S., read his paper on "Educational Systems" (see DENTAL COSMOS, vol. xlv, November, 1902, page 1132).

The PRESIDENT. The general discussion this afternoon embraces three topics prepared last year for our consideration. The first is, "What are the preliminary studies to be required of students before beginning their professional education?" I will ask Professor Hesse, of Leipzig, to open the discussion.

Professor HESSE (speaking in German). All I have to say on this question is printed in the first of the three fasciculi issued by the Federation, and I expect that everyone will have read them, and anything I might say would be simply repeating what is already printed; therefore I prefer to say nothing now.

The following is an extract from Professor Hesse's report:

REPORT TO THE INTERNATIONAL COMMISSION OF EDUCATION BY PROFESSOR DR. HESSE. LEIPZIG, GERMANY.

Following the decision of the International Commission of Education, I have the honor of submitting the following answers to the questions proposed by the Commission:

First: "What should be the preliminary requirements for admission into dental schools?"

Answer. It should be similar to that required of medical students.

Second: "What should be the length of time devoted to the study of dentistry, and the arrangement of the curriculum?"

Answer. The duration of the course should be of three years at least. The curriculum should comprise—(a) Natural science, namely, physics and inorganic chemistry; (b) Medical sciences, viz, anatomy, physiology, general pathology, bacteriology, embryology, general surgery, and materia medica; (c) The science and art of dentistry. In these studies a prominent place should be given to practical dental work. During all the time devoted to the various divisions of the course the dental student should be required to devote at least three hours daily to practical operative and technical studies. This course would have for the student the same value as the attendance at hospitals has for the medical student.

Third: "What part of the subjects that are taught in medical schools should be pursued by the dental student?"

Answer. The dental student should follow a general course in physics and chemistry, and should also follow a course in general anatomy, general pathology, embryology, and bacteriology. We recommend that a special course in general anatomy, physiology, general pathology, and materia medica should be given to dental students, as we deem that these topics embrace many features which are of no value to the dentist, and which cannot be acquired in the lapse of time at the disposal of the dental student.

Dr. QUEDOT, who spoke in French, was of the opinion that it is impossible to have a good dentist unless he is an educated man. The preliminary instruction is especially important, and in the professional education should be included such subjects as bacteriology and others that are included in a medical curriculum but are not really medical. Only the best is good enough for dentists. After that the student may take up his work in the dental school, and take it up with a light heart, because he has been well trained and has a firm leg and a strong arm. What was difficult becomes easy because of the good training he has had before.

Dr. B. HOLLY SMITH. My own impression is that the work we have to do this afternoon is the discussion of Dr. Brophy's address and Dr. Barrett's paper, and I will come directly to that. The education of the dentist must be separated from that of the medical man. I ask you to consent to the discussion proceeding on those lines, because however broadly the foundation of medical education is laid, however widely and

definitely the plans are made for the education of the student who attempts to practice dentistry, medical instruction is lost time. Start your student to study anatomy, physiology, bacteriology, therapeutics, and materia medica in the dental school, but do not send him to men who are teaching general anatomy, general pathology, and general physiology. Put him absolutely under the control of competent, capable, cultured people who know his specialty, and who will train him for it. I say that because life is short. We begin too late to do our life's work. Thirty-one years! You cannot start practicing so late as that. How much of life has gone in those thirty-one years! If you propose to have a medical education, a dental education, and a degree from a literary institution, you are thirty-one years old when you start to practice dentistry, and we cannot have that. It is extremely embarrassing to me that I cannot understand the question.

Dr. AGUILAR. You have understood it.

Dr. HARLAN. Perfectly.

Dr. CUNNINGHAM. Not at all: I protest! Did you say, Dr. Quedot, that a dentist must have a medical education?

Dr. QUEDOT. No.

Dr. B. HOLLY SMITH. I want to say with regard to the very able paper of my dear friend and beloved *confrère*, Dr. Brophy, that I admire many of the elucidations of what we consider in America some intricate problems in education. I admire it because as a teacher of long experience he has determined a course. In the city of Stockholm I have admired as much as anything else the beauty of the water, the lovely architecture, and the lovely display of nature's gifts, but I have admired one thing above all, the quickness and promptness of the driver, the man who knows the way, the man who goes fast, who steers clear of disaster. My dear friend Dr. Brophy has opened the way for us with regard to education, and that is the way we must follow. A university can never teach dentistry and medicine together. If we establish a course in dentistry and have

professors of medicine, professors of physiology, and professors of chemistry, and the student studies dental chemistry, dental physiology, and dental anatomy from his own standpoint, then it is possible, but it is not possible when you say that a dental student may slink in through the door and may take what he can get from a medical man by the side of the medical student, and then when the time comes for examination he is told, "Oh, you are only a dental student!" We cannot have that! I do not say that a man, because he is a medical man, could not prepare himself to teach these students, but you cannot have medicine and dentistry taught together. I am opposed to it. Dr. Barrett made a remark that Dr. Harris had endeavored to establish a dental course and said that that was an incident which was unimportant.

Dr. BARRETT. I did not say such a thing; I said that it was merely an incident that had occurred in America, but it might have occurred anywhere else. It had nothing to do with the merits of the case that it occurred in America first.

Dr. B. HOLLY SMITH. I stand here as the representative of the Baltimore College of Dental Surgery, the first and oldest college in the world, and I say that dentistry must feel grateful that Chapin A. Harris and Horace Hayden established a dental school. Why do I say so? I feel the absolute importance to be attached to the beginning of dentistry, and I think there is no excuse whatever for passing that by as an unimportant question. Dentistry began in Baltimore, and dentistry will continue throughout the world. There never will be a time when dentistry will lose its identity as an individual and distinct calling.

The PRESIDENT. It is desirable, if we can, to limit our discussion as far as possible to the three general questions. I do not think it is expedient to pursue further the remarks on the papers that have been presented. We ought to dispose this afternoon of the discussion of the papers that have been presented, and when we meet together again we can then take up the three general questions.

Dr. GEORGE CUNNINGHAM. While I do not desire to make any speech at all or go into the merits of the question, I want to make you acquainted with the fact that, owing to work which I have to do, I cannot be present, and I should like to take this opportunity of telling you that a great reform has taken place in England with regard to preliminary education. At the present moment they are discussing the Education Bill in Parliament, and that bill will make a great deal of difference to the future history of England. There is a great reform which has taken place, and the nation has not yet learned it. The new University of London has decided that Latin will no longer be compulsory on the medical, dental, or other professional student, and you will see from that that a great step has been taken.

Dr. BARRETT. I do not want to be misunderstood. That Chapin A. Harris was an American was merely an accident and has nothing to do with the question. He might have been an Englishman, a Frenchman, a German, or a Spaniard, and it would not have changed matters or made any difference. I said it was merely an incident that he was an American. I am an American, but my sympathies do not stop with America by any means. We have good American schools, but they have good schools elsewhere. In America I think in some respects we are superior, but there are schools in other countries which in some respects are superior to ours. The question is, May, with propriety, dentistry be taught in the medical schools? It depends on the dentistry. With us the mechanical is the dentistry and cannot be taught in a medical school. In many countries it is medical teaching, and should be taught in a medical school. My point is, Is there not a common ground on which we can meet—English, French, German, Swedish, American, under the different systems—some common system, so that when an American shall desire to enter a German school he may receive the credit for that which he has accomplished, and a German in an American school may also receive the credit for his work?

I do not think it would be wise to permit a German to practice in America without any restraint, or an American to practice in Germany. There must be the national regulations to be observed, and hence if a German comes to America he should take a term in an American school and become acquainted with our methods. If an American goes to Germany it may be best that he should take a term in a German school. Is there not some middle ground which would be common to all of us on which we could all meet and shake hands—German, French, English, and American together?

The discussion was continued by Professor FRANK and Dr. GUERINI in German and French respectively.

Dr. AGUILAR* (Madrid). I believe that we are here now for the discussion of three points on which I think resolutions should be taken. Therefore I shall move to present certain resolutions.

The PRESIDENT. Let me suggest that inasmuch as the three questions have not yet been considered, these resolutions are not yet appropriate.

Dr. AGUILAR. What are we discussing?

The PRESIDENT. The three questions will be discussed.

Dr. AGUILAR. We are discussing them now.

The PRESIDENT. No; we are discussing the address of the President and the paper of Dr. Barrett.

Dr. AGUILAR. Then I will say nothing.

Dr. GUILFORD. Will this subject be continued on Monday?

The PRESIDENT. This is a subject to which we might devote some time on Monday. It is absolutely necessary that the three subjects before us should be considered. They were proposed last year and are before the Commission for discussion, for further consideration, and for adoption. These questions may,

however, be discussed if the gentlemen will meet promptly at nine o'clock. I would suggest that instead of coming to this Institution we convene in the Grand Hotel where we are stopping, and thereby save much time.

Dr. GUILFORD. I would suggest that we confine ourselves to the discussion of the questions themselves. We are not here to discuss the beginnings or history of dentistry or anything else.

The PRESIDENT. This afternoon the question was the address, and after that subject has been disposed of comes the consideration of the three questions; and when we come to the consideration of the three questions other topics will not be discussed.

Professor HESSE. I should not like to leave this room without saying one word of thanks to Professor Brophy, not only for presiding so well, but for his excellent paper, and especially for having it printed in German and in French. That is a great advantage, for our greatest barrier of separation is in the fact of our not understanding each other's language.

The PRESIDENT. I thank Professor Hesse for what he has said, and I would like at the same time to say that the translation of my address is not accurate. Some errors have been made that may slightly change its meaning, and I would therefore like to have those who have read the address in French and German withhold their judgment upon it until they see it printed in an accurate translation. Some words have been omitted here and there. I think it is eminently fitting that whoever reads an address in English should have it printed in two or three languages. It is a simple thing and it helps so much in coming to an understanding of what the author intends to convey.

Adjourned to meet at 9 A.M. Monday, August 18th, at the Grand Hotel.

(To be continued.)

AMERICAN SOCIETY OF ORTHODONTISTS.

Second Annual Meeting.

THE second annual meeting of the American Society of Orthodontists was called to order by the president, Dr. Edward H. Angle, of St. Louis, at 10 o'clock Wednesday morning, October 8, 1902, in the parlors of the Colonnade Hotel, Philadelphia, Pa.

The secretary, Dr. Milton T. Watson, Detroit, Mich., read the minutes of the last meeting, which were approved.

The reading of the president's annual address was deferred until a later meeting, on account of there not being as full an attendance as was expected later.

After the transaction of the regular business on hand, the secretary read a paper by Dr. ANNA HOPKINS, of St. Louis, an abstract of which follows, on

ORTHODONTIA FROM THE STANDPOINT
OF THE STUDENT.

The essayist reviewed at length the present dental educational system, saying that it was such as to carry the student to the third course of lectures without his having had any teaching in the branch of orthodontia, devoting the time to operative and prosthetic work, crown and bridge work, etc., entering upon his third year thinking that he knows a great deal about dentistry. He has yet to discover, however, that there are a great many things that he has to learn. Then in his third year he is given a few lectures on this subject, and by a few demonstrations is taught to make a few appliances. He knows probably nothing about normal occlusion,—is unable to tell the proper relation which the teeth and jaws should bear to each other. It is impossible for him to learn this in the short period of one course, and that along with other studies. If he is taught, as he should be, the proper occlusion of the teeth, the foundation of all his labors in the future, his mind will be better prepared to see the necessity of it in all his work. He would see the necessity for

proper occlusion, and be able to apply the principle taught in many details of his work,—in his crown and bridge work, filling, etc. If he is taught this principle to begin with, he cannot but realize that dentistry has a more scientific meaning than he can appreciate without this knowledge. He would then understand the necessity of filling the teeth, and would be studying orthodontia all the time.

Then in his third course he probably has a case of irregularity to correct. He does not know the trouble, only knows that the teeth are crooked and need to be brought back into the arch. He proceeds to make his appliance. Not being familiar with the work and not knowing what he is trying to accomplish, and not knowing the best character of appliance for the case, he has great difficulty in keeping his appliance in place. He then probably finds that the thing is moving the wrong tooth, and he has no idea how to correct it. His patient comes at the wrong time, cannot be induced to keep appointments, and everything seems to combine to discourage the student. He finds that the experience of others has been the same as his own. He grows disgusted with the work, and declares he will have nothing to do with orthodontia when he gets out of school. Consequently he graduates with a vague idea of orthodontia as something to be left for the other fellow; does not understand the principle of occlusion, and is consequently handicapped in all his work. For it has been clearly demonstrated beyond a doubt that all operations done in the mouth can be done better with a proper knowledge of occlusion.

As the courses are at present laid out it is impossible to give the proper time and attention to orthodontia along with the other work while this is crowded into three years. Thoroughness in the work

is out of the question. Of all the branches taught, orthodontia is the one most neglected in the college course. It is left for the last minute, so to speak, when as a matter of fact it should be started with the other lines so that it will help the student in all of his work.

Compare orthodontia with the other branches from the standpoint of the instruments used in their pursuit. In the operative branch the finest instruments are required to be used, and in the laboratory a full set of instruments is required. What teacher would expect a student to use a plugger, chisel, or excavator of his own manufacture; and yet in his orthodontia work he relies upon his own skill and ingenuity to manufacture the appliances for the work. No thought or preparation is made for the orthodontia work which the student is to undertake; yet in the other branches he is thoroughly equipped before he is allowed to attempt any work at all. On the contrary, it would seem that every hindrance is thrown in the student's way in this work, instead of his being encouraged in a work that is to the student not so attractive as the other lines, but one that to my mind is of the utmost importance if he would succeed in his profession.

It was with this idea in view that the National Association of Dental Faculties has decided to add another year to the course, as they think that orthodontia has not been properly dealt with. At all events, if orthodontia is to be learned in the college course, a higher plane must be adopted, and there must be made some radical changes in its teaching. The first principles of occlusion must be thoroughly taught from the start. There must be a proper place set aside for the teaching of the technique, thorough practice in the making of models, taking impressions of practical cases of irregularity, studying the original conditions and devising means for the best methods of correcting them. A laboratory, separate and distinct from the others, must be devoted to this work. This line of work can be given during the second year. Next, the study of the

different classes of irregularity, studying the different classes from models prepared by the college, and learning to classify them; taking impressions of actual cases of irregularity; studying the relations of mal-development, and the consequent conditions of its influence; studying the physiology and etiology of development, and the extent to which it relates to and is dependent upon the teeth. He can then in his next or fourth year undertake the correction of practical cases; he will know something about it theoretically. Let him devote one or two afternoons each week to the question of orthodontia. Such a course of study, or one similar, would tend to give orthodontia its due position. The student will learn to look upon it as upon other studies. Then in this fourth or last year, if a student is found to be especially interested in this line of work, give him special privileges to devote more time to it, and give him a chance to perfect himself in this specialty if he desires. This work can only be done by those who are interested in it and can show results. This specialty can only be developed separate from the general subject of dentistry, and those especially adapted to this work must be encouraged and given an opportunity to develop the specialty.

Discussion.

Dr. W. J. BRADY, Iowa City, in opening the discussion, said that being a teacher of orthodontia he was deeply interested in the subject of the best methods of teaching it, and that he could appreciate the points brought out by the essayist, and believed that it was the case with most schools that the subject was neglected as the essayist portrayed it. He said that during his experience in teaching it he had been handicapped considerably by the fact that the subject was not properly looked upon by the profession, and was consequently practically overlooked by the colleges. He had had to fight against lack of time to teach it, improper rooms for the laboratories, insufficient facilities, and most of all indifference on the part of the students. After several years of hard struggling he

had managed to bring about a better state of affairs, and was succeeding in doing more with it at present. He said he had examined other schools and their methods of teaching, and found that they suffered from the same trouble that he had, and to a greater extent. He was hopeful that the four years course would develop something in the way of practical work and better chances for the students of orthodontia. With regard to the matter of instruments for the work, he believed that if the same were required of them in operative work, no more would be accomplished than in orthodontia. If he had no better instruction in filling teeth than in orthodontia he would be a no better operative dentist than orthodontist. He felt that the lack of time and facilities, and insufficient teaching, are no more responsible for the predominant ignorance on the subject than the fact that the student is made to dabble with appliances, and has to make his own. He has no more right to make his regulating appliances than his operating appliances. They are the instruments with which he works. They are only a small part of orthodontia. They bear the same relation to orthodontia that plugger-points, chisels, etc., bear to operative work, and yet this fact is not recognized in teaching the specialty, and he felt that no real progress can be made along this line as long as the student is made to manufacture his own appliances.

Dr. KIRK, Philadelphia, said he could speak on the question from the viewpoint of the teacher, because his work bore some relation to the general study. He could not agree with the essayist and the speaker who just preceded him, with reference to the present condition of orthodontia teaching. He quite agreed with the essayist that the great impetus which the laws of occlusion have given this branch of science has shed a new light on the subject, and makes it important that more attention should be paid to it than in the past. It is true, though, that we did not know anything definite about this until Dr. Angle gave us the principle. He did not know the

essayist personally, but surmised that she graduated before this principle began to have its effect upon dental teaching. She said that it was in exceptional schools only that any attention was paid to the question of occlusion, but he could say with reference to the school with which he was connected that the principle of occlusion is recognized as the foundation of nearly all practice, and realizing as they did this relation they begin to teach the principle at the beginning of the course. He did not claim that they were offering a perfect system, but that they realized the importance of this principle and were endeavoring to enforce it.

He heartily commended in the paper the idea that the specializing of orthodontia should be the outgrowth of natural selection. He also agreed with the essayist with regard to the disposition of the fourth year. He felt that the early part of the course should be based upon the idea of training the student in the foundation principles of dentistry, and the fourth year should be devoted to the development of specialties. The tendency is to expect too much from the college course, for we do not appreciate the fact that the college course does not carry the student as far as the complete education of the specialist. He said he trusted the dental profession understand that the educational institution can only go so far. There is a great significance in the name given to the graduating exercises,—“commencement.” The most that any institution can do is to train the student in certain habits of study, and he commences then to develop these lines of study into a system of self-education,—an education which is an outgrowth of his contact with life.

Dr. RICHARD SUMMA, St. Louis, said he did not think the essayist intended to state that there were no schools teaching the foundation principles of occlusion, but that there were only a very few schools teaching it. He said we come in contact with a great many men in the profession who do not know really what occlusion is. We meet a great many men who have practiced for years

and hear them remark that certain teeth are out of occlusion, and others normal. Occlusion, as we know it, is misunderstood by a great many. As the essayist and Dr. Kirk said, occlusion is not only necessary for orthodontia, but for the understanding and proper practice of any of the branches of dentistry. While everyone who studies occlusion does not want to become an orthodontist, yet everyone must know occlusion thoroughly enough to be able to recognize the initial stages of malocclusion, and must know when teeth are in mesial and lingual occlusion, and mesial and distal occlusion, so that he can warn the patient and direct him to someone who will undertake the correction of the case.

Dr. GREVERS, Amsterdam, Holland, thought that the essayist considered only one side of the question. She did not consider it from the college point. He thought it was asking too much to demand that the students be perfected in orthodontia in the colleges. She lost sight of the fact that it was the object and duty of the colleges to give the student as much as they could in the way of fitting him for starting out in life as a dentist. He agreed with the gentleman who opened the discussion that there should be special schools to perfect the men in orthodontia.

Dr. L. S. LOURIE, Chicago. As I see the question, from the point of the essayist, there was no intimation that students did not get enough. I think the idea was that the selection of the information given to the student was not as it should be. Instead of instructing students in the construction of appliances, etc., the school should give them the fundamentals of orthodontia, and teach them the relation of orthodontia to the other branches.

Dr. F. M. CASTRO, Columbus, Ohio, commended the paper very highly, saying that he agreed with the essayist in her ideas about the teaching of orthodontia. He said he met many men who did not understand occlusion, young graduates as well as some old practitioners. He thought that occlusion was not taught as it should be in the major-

ity of colleges to-day, and that a great number of men are turned out every year who do not understand occlusion. It has been said, and truthfully, that occlusion is the foundation of all dentistry; how necessary it is, then, that occlusion should be taught thoroughly in all dental colleges! We might just as well take a medical student and give him a few lessons in anatomy and turn him out as a physician, as to turn out a dental student without a thorough knowledge of occlusion. A surgeon who does not know anatomy and a dentist who does not know occlusion are about the same thing. All our work is dependent upon this, and he did not understand why it has not been taught. As to the specialist of orthodontia, he did not think that the essayist intended that all dental students should be specialists in orthodontia.

He agreed with Dr. Kirk in making the fourth year elective. What we want for students is for them to know enough about this branch so that they will appreciate the importance of it, and when they have a case of irregularity to refer it to a specialist in that line. We want the student to know enough of this branch to enable him to start out to practice it. Like Dr. Brady, he had instituted new methods entirely in the last year. In most of the schools of the present day the student is not given the proper course in this work; they have not the facility for the work.

Dr. ANGLE, St. Louis, said that from his experience in teaching in four different schools he thought it was practically impossible in the regular college course to get students properly interested in orthodontia so as to teach it to them as it should be taught. He said it was very easy to get up enthusiasm at the beginning with the younger students, but they would soon lose interest in it, and it would finally settle down to only a few out of the class that were interested enough to keep it up. He said this state of affairs was due to the fact that there were only a limited number of them that would naturally prefer this work to any other, and these sometimes

would lose interest from the fact that the college faculties could not be induced to give it the proper attention, such as the time and facilities for teaching it. He said it was this experience that led him to establish a private school for the purpose of teaching orthodontia only, and his first year with this school gave him more pleasure and satisfaction than his entire experience previously.

He thought the idea of Dr. Kirk to arrange the course so as to allow the students the opportunity to specialize in the fourth year was a very good one, but the best plan, he thought, would be to teach orthodontia in a school especially for the purpose; say, have two or three of these in the world, and let each be a department of a university, or a separate school for that work. He thought the principles and details of orthodontia required it to be taught to classes separately from the general profession.

Dr. MILTON T. WATSON, Detroit, said that as he had read the paper probably some of the gentlemen thought he wrote it. While, however, he did not write it, he was in full accord with the sentiment it expressed. With reference to the time spent in the dental college in making appliances that were of no earthly use, he thought it was a curse instead of a benefit to the student. He said it was simply the development of the mechanical ability, and the time would be much more profitably spent in studying the principles of occlusion.

With regard to Dr. Grevers' point that the students were being overcrowded, he thought all agreed with him that the course was more than they could pay proper attention to, and their hope was that with the addition of the extra year more attention would be paid to orthodontia.

On motion the subject was passed and the meeting adjourned until afternoon.

FIRST DAY—*Afternoon Session.*

The meeting was called to order at 2 o'clock by the president. The next order of business being the president's address, Dr. Brady took the chair, and

Dr. EDWARD H. ANGLE, of St. Louis, read his annual address, an abstract of which follows:

PRESIDENT'S ADDRESS.

Dr. Angle, in reviewing the history and origin of the society, said its inception was prompted by a realization on the part of those especially interested in this subject that it was not receiving the proper attention from the profession in general; that its importance was not recognized, and they deemed it their duty to take steps to advance the science, and felt that this could best be done by making it a separate and distinct branch of the profession. The men who started this movement, he said, believed they were right, and they also received wonderful encouragement from the profession as a whole; and to-day orthodontia was more nearly an exact science than any other branch of professional work.

The essayist said that this, the second meeting, marked another important event in the evolution of orthodontia. Last year's meeting was a very successful one, and the founders were very much encouraged and hoped this meeting would be in full keeping with the importance of the subject, and as successful as the first in furthering the interests of orthodontia in scientific research, theory, and practice.

He believed it would prove to the interest of both orthodontia and the general profession to separate and develop along special lines. The research in orthodontia work, while very interesting and instructive to the orthodontist, was not of interest to the general practitioner. In a general practice the dentist had only a few cases of orthodontia each year as compared with other work, and naturally his attention was turned to his main work, to the neglect of orthodontia. He lost interest in the latter, and would finally get to where he did not care to bother with it, as being probably not so remunerative nor so agreeable to his tastes. He was thus liable to make mistakes in diagnosing cases, and liable to cause more harm than good in the treatment of them. While there were now

practically few orthodontia specialists, he said he believed the time would come in the course of a few years when every town with as many as 20,000 inhabitants would have a specialist in this particular line of work. He appealed to the general practitioner to help and encourage the young men who were turning their efforts in this direction by referring to the orthodontist cases that should come under his special care.

He called the attention of the orthodontist to the great amount of good that could be accomplished by him, and impressed upon him the necessity for deep study and further investigations in the work of harmonizing the features of the human face. He also called especial attention to the part that the alveolar process played in the orthodontist's work, and urged further study of this process, saying that as yet we know very little about its nature.

He also spoke of the close relationship between the orthodontist and the rhinologist. They should co-operate in their work, and thereby prove of benefit to each other, as only a thin bony septum separated their fields of labor. He expressed his belief that, from the fact of many diseases of the nasal cavity being due to conditions in the oral cavity and *vice versa*, much benefit would be derived, by themselves and by the patients, and in this way they might hope to determine the bearing which diseases of one cavity had on those of the other.

Discussion.

Dr. J. HEAD, Philadelphia, in discussing the paper said he was very much impressed with the idea expressed that the practice of dentistry was too broad for one man to master it all, and believed much good could be done by specializing. He said he believed many errors in the correction of irregularities would be avoided and many valuable teeth would be saved from extraction.

Dr. L. A. FAUGHT, Philadelphia, said the paper recalled to his mind the comparison of dentistry with other professions, and that dentistry was certainly the most progressive of them all,—daily

discovering new ideas, methods of practice, etc., preventing what is so common in other professions, the increased value of old men to the profession from having had such a range of experience in the work. Not so in dentistry; the old practitioner could not settle down on his experience, but had to be up-to-date with the younger members. This was very little consolation to the members of the profession who were increasing in years, but it showed that dentistry was in the lead in the march of progress.

On account of having several other papers on the program for this meeting, the discussion was closed, and Dr. ROYAL S. COPELAND, M.D., of Ann Arbor, Mich., read a paper, an abstract of which follows, on

NASAL OCCLUSION AND SEPTAL DEVIATION IN THEIR RELATION TO ANTRAL DEVELOPMENT AND FACIAL EXPRESSION.

The essayist reviewed the relation of the rhinologist to the dentist, showing the importance of their co-operation in the treatment of the nasal and oral cavities. He attributed a majority of the cases of malocclusion to accidents in early life affecting the bones in the vicinity of the maxillary bones, such as deviation of the septum, interfering with the antral cavity, and consequently with the proper development of the maxillary bones. He said that on account of the delicacy of the tissues in this region, a slight accident, such as a fall, to a child in very early life, which at the time would hardly be noticed, could very easily interfere with the development of the bones of the face. He said these deviations of the septum would interfere with proper breathing and lead to mouth-breathing, which plays such an important part in the causing of irregularities of the teeth and deformities of the oral cavity. He said that a great error was made in classifying this character of cases as "acquired." He said there were a great many cases that could not be attributed to such causes, and that they were in most instances congenital. He believed many errors were

made in treatment from the fact that patients came to the dentist when they should go to the rhinologist, and it was for these reasons that he urged the working together of dentist and rhinologist, believing that much good could be accomplished, not only to the patients, but to the rhinologist and the dentist.

The discussion of Dr. Copeland's paper was deferred until after the reading of the next paper, by Dr. C. H. KOHLER, M.D., of Minneapolis, Minn., an abstract of which follows:

THE DEFORMITIES OF THE SUPERIOR MAXILLA FROM THE STANDPOINT OF THE RHINOLOGIST.

The essayist in the beginning of his paper said that he believed the great majority of cases of mal-development of the jaws were due to inherited tendencies. Where one parent was in an unhealthy condition, or both were in a degenerated state, such condition would naturally assert its influence in the development of the tissues of the head of the offspring. He also claimed that the bones of the head and face were very susceptible to these influences, and that this degenerated condition would manifest itself very readily in the bones of the maxillary region and the process of development would not be normal, on account of the faulty character of the bone tissue itself and the surrounding soft tissues, and therefore there would be a natural tendency to adenoid growths and an interference with the air passages, and consequently to mouth-breathing, the prime cause of irregularities of the teeth. He also said that the child would have a predisposition to coryza and a consequent depletion of the system and lack of vitality in the nasal region; it was frequently the case that a child would have a cold, and from the inability of the tissues to resist its effects, this was often the beginning of mouth-breathing.

Claiming that environments, climate, hygienic conditions, etc., played an important part, in that they exerted their influences on the parents, he gave a table prepared from his observations and

studies of these conditions, showing that climatic and hygienic conditions lead to constitutional weakness, these being the indirect causes leading to the direct causes,—adenoids, enlarged tonsils, nasal hypertrophies, and mouth-breathing. The essayist claimed that this faulty development did not manifest to any extent its presence until about the tenth year or after, which he thought was borne out by the fact that so few cases of irregularity existed prior to that age. He said it was a great mistake upon the part of dentists to endeavor to correct these irregularities by means of mechanical appliances, as the cause would have to be removed before any good could be accomplished, and urged the co-operation of the dentist and the rhinologist in their work on these tissues.

Discussion.

Dr. COPELAND, in discussing the paper, said that he was much surprised that none of the members felt disposed to discuss his and Dr. Kohler's papers, and that he was not accustomed to reading a paper before a society and being agreed with by all. He urged that the members discuss it, and wanted to know if they all agreed with the statement that Dr. Kohler had made with reference to all irregularities being caused by mouth-breathing. For his part he did not believe this as a general proposition. He believed many cases of irregularities resulted from accident and from other causes, and he wanted the members to tell him whether Dr. Kohler was right in stating that degeneracy was the cause of all these types of irregularities.

Dr. WATSON said that Dr. Kohler's theory that no irregularities occurred in the deciduous teeth was not altogether true, as he had seen a number of cases of the most pronounced type in children as young as three years. He said the essayist had dealt with only one type of irregularities,—those produced by nasal troubles,—but there are other types in no way associated with nasal trouble.

Dr. BRADY, of Iowa, said the statistics on the causes of irregularities showed that only twenty-two per cent. were

caused by mouth-breathing, and that the majority of them were due to causes having no connection with mouth-breathing.

Dr. ANGLE said he was very grateful to Dr. Kohler for his paper, and felt that he had brought out some very valuable points bearing on the causes of irregularities; and while he did not agree with him that all cases of malocclusion were brought about by mouth-breathing, still he was sure the paper would do good in drawing the attention of the orthodontists to this view of the question, and they would necessarily investigate and study it from that view more than they had hitherto done.

Dr. KOHLER, in closing the discussion, called attention to the fact that he was only considering the question from the standpoint of the rhinologist, and gave his views rather to bring out the orthodontist and get his ideas on the subject. His object in bringing out the paper was for the exchange of views, and to impress upon the orthodontist the necessity of co-operation with the rhinologist and of studying the question from that point of view.

This closed the discussion, and the society adjourned to meet Thursday morning.

SECOND DAY—*Morning Session.*

The meeting was called to order by the president.

Dr. R. OTTOLENGUI, New York, read a paper (an abstract of which follows) entitled

RETRUSION OF BOTH JAWS WITH A SINGLE APPLIANCE.

The essayist reviewed the present system of nomenclature, as originated by Dr. Angle, with reference to the classification of malocclusion, saying it was misleading, and was not definite enough to be understood by any except those who made a special study of the subject. He said he had studied it a good deal, and had had some correspondence with some of the members in regard to this, but he did not understand the system at all,

and it was far from being clear to his mind.

The paper dealt principally with a case of upper and lower prognathism, in which by the use of a single appliance the upper jaw was made to act in such a way, during the process of correction, as to retrude the lower jaw at the same time.

In the correction of the case he wanted to accomplish the result without the use of the headgear, which was so objectionable to patients generally. After some studying his plan of procedure was to extract the four first bicuspid, and first to devote his attention to the upper jaw and correct the lower later. With this object in view he made a metal plate for the upper jaw with clasps to fit over the molars and attached a Jackson crib. The appliance was placed in position, and after the lapse of a few days, when the teeth began to move, he noticed the lower teeth were moving with the upper,—the upper acting as an inclined plane and drawing the lower backward with them. After the teeth had been drawn back sufficiently he made an appliance to retain them in position.

The essayist described several cases of similar character treated in the same way, and recommended this method as very advantageous in cases where it was objectionable to use the headgear.

Discussion.

Dr. SUMMA, in discussing the paper, referred to the terminology of irregularities, and said it was very clear to all students of orthodontia, but that he had never been able to explain it satisfactorily to Dr. Ottolengui. He spoke of Dr. Ottolengui's treatment of the case in question, saying he thought it was unnecessary to extract the teeth, as it could have been corrected without it, and that there were exceptionally few cases in which extraction was warranted. He did not think that a normal occlusion could be obtained where the teeth were extracted, and by the methods used at present the great majority of cases could be readily restored without resorting to extraction.

Dr. WATSON said he thought Dr. Ottolengui's trouble with the system of classification of irregularities was due to the association of the terms mesial and distal with the facial line. It had nothing whatever to do with the facial line, but referred entirely to the teeth and their occlusal relations. He thought the classification was as simple as it could be made considering the ground to be covered. With regard to the treatment of the special case under consideration, he said he could not criticize Dr. Ottolengui for the extraction of the teeth without a close and careful study of the circumstances, but he would say that there were exceptionally few cases in which extraction was necessary.

Dr. ANGLE said he felt it his duty to make a few remarks in explanation of the system of nomenclature he had adopted. He said it was the result of much study and thought on his part, trying all the time to get as simple a system as possible, that would cover the ground, and that the present system was the decision. He said he thought the difficulty was with the mixing it up with the facial lines. He said he had known many men attempt to describe cases of irregularity who were at a loss to class them, and it was this that led him to the adoption of the present system, as all cases could be so readily placed in their particular class.

Dr. HEAD said the difficulty of most dentists with the system of classification was that they would associate it with the anterior teeth and with the facial line. He believed the present system was as simple as it could be made, and that it enabled the dentist to readily class cases that he had been unable to class heretofore.

Dr. OTTOLENGUI, in closing the discussion, said he admitted that there were very few cases in which extraction of the teeth was necessary, but that after careful study he believed that it was fully warranted in this case. He said his main idea in bringing out the paper was to show the possibility of the correction of such cases without the use of the head-gear.

Dr. WM. J. BRADY, Iowa City, Iowa, then read a paper on

THE CAUSES OF MALOCCLUSION.

The essayist gave a description of the anatomy of the tissues of the fauces and of the nasal and oral cavities, and showed their relation to each other in the production of malocclusion, claiming that non-oxygenation of the tissues played the most important part in the production of irregularities, in that it interfered with the development of the tissues of the maxillæ, and, by the breaking up of the normal relations of the jaws, would cause the over-development of the mandible.

Dr. GREVERS, Amsterdam, Holland, in discussing the paper said he could not agree with the essayist in his conclusions, and his theory was that it was not an arrest of the development of the maxillæ, but the development in the wrong direction, claiming that the influence of the tongue had considerable to do with this development in its normal position.

The paper was further discussed by Drs. Monroe, Barnes, Ottolengui, and Brady, who closed the discussion. The meeting then adjourned.

SECOND DAY—*Afternoon Session.*

The meeting was called to order Thursday afternoon at 2 o'clock by the president, Dr. Angle.

Dr. M. H. CRYER, Philadelphia, gave a very interesting illustrated lecture on the relation of the nasal cavity to the mouth, and also the relation of the tongue to the oral cavity in its normal closed condition, showing that the tongue completely filled the oral cavity, and that it naturally played an important part in the development of the tissues in the cavity.

Dr. LLOYD S. LOURIE, of Chicago, read a paper on the "Distal Movement of the Molars and Bicuspids," making an appeal against the too early extraction of temporary teeth, saying that this was an influence in this direction, relieving

the backward resistance to the bicuspid. He also showed that the extraction of the permanent molars so recklessly practiced was the frequent cause of the distal movement of the teeth anterior to them. The essayist also described an expansion arch for the correction of these cases.

After a short discussion the paper was passed, and

Dr. H. A. PULLEN, Buffalo, read a paper on "Stationary and Removable Appliances, Alone and in Combination," and exhibited models showing the uses of the appliances, and cases corrected by the combined use of appliances of different character.

After considerable discussion, criticizing Dr. Pullen for the use of so many varied appliances and emphasizing the value of simplicity in regulating appliances, the paper was passed, and the meeting adjourned until Friday morning.

THIRD DAY—*Morning Session.*

The meeting was called to order by the president at 9 o'clock.

A paper by Dr. J. HUMPHRIES, Leeds, Eng., of which the following is an abstract, was read by Dr. Brady:

VARIATIONS IN HUMAN DENTITION.

The essayist reviewed the data with regard to the changes in the teeth of animals and man in all the past ages. He claimed that the dental arch was growing smaller, and that eventually the lateral incisors would disappear from the arch. His theory in proof of this conclusion was based on the study of the early races, and he described cases in which there was a third incisor, and it frequently appeared now as a supernumerary tooth. He claimed that civilization has brought about such changes in the character of food and the method of preparation as was conducive to these teeth falling into disuse and finally disappearing. He gave many instances where they were missing. He believes that eventually the third molars and the lateral incisors will disappear from the arch.

Discussion.

Dr. LITTIG, New York, said he thought the essayist was inclined to attribute to decline of the race what most scientists attributed to inheritance. He recalled several instances where the loss of the lateral incisor occurred in several members of the same family, and he thought it was due to hereditary influences.

Dr. GREVERS could not agree with the essayist in his conclusions. He had made extensive study along this line, and his research with regard to the size of the dental arch would not justify the author's conclusions.

Dr. SUMMA said the paper called to mind one written by Dr. Albrecht and translated from the French by Professor Pearson, in which he described cases of an extra intermaxillary bone. He said this might explain the presence of the third incisor, and expressed the opinion that when this extra intermaxillary bone was present it was likely that the third incisor would appear in this bone.

Dr. E. C. KIRK, Philadelphia, then gave a lecture, illustrated by the use of the lantern, on

THE COMPARATIVE STUDY OF MANDIBULAR PROTRUSION.

The speaker suggested the need for something more than the Angle classification of occlusion as a basis for the study of irregularities of the dentures. He called attention to the fact that while the arches might be practically in normal occlusion, yet prognathism or protrusion of either the mandible or the maxilla might be so great as in itself to constitute a deformity. He considered it necessary, therefore, that some basis for measurement be taken as a standard of normal position of the arches with reference to the facial region, and called attention to the relative fixedness of the mental foramen as an anatomical point from which to base conclusions with reference to the malposition of the dental arch as a whole. He directed attention to the observations already made by Dr. Cryer and others as to the difference in character and development of the alveolar processes as compared with the

mandible and maxillary bones upon which the alveolar structures were superimposed, and demonstrated, by a series of photographs of developing jaws, that while the dentures and the alveolar supports thereto tended to move forward upon the mandibular base, the mental foramen remained a relatively fixed point. He called attention also to the recurrent character of the cribriform tube of the mandible, just previous to its exit at the mental foramen, as additional evidence of the anatomical fixedness of the body of the mandible and the more or less movable character of the alveolar borders superimposed upon it.

Having called attention to those developmental characteristics of the alveolar borders, the speaker presented photographic illustrations of the skull of the English bulldog, and directed attention to the degenerate character of the animal, which degeneracy was probably the result of artificial selective breeding continued for a long period. The skull showed the early arrest of development of the maxilla and protrusion of the mandible, which in the most marked specimens had in the course of its growth acquired an upward turn in the incisor region, due to the extrinsic force of the masticatory muscles. Comparison of the bulldog skull with that of the typical canine denture, as it is exhibited by the timber wolf (*Canis latrans*), clearly demonstrated the degenerate character of the bulldog. The timber wolf showed a perfect carnassial denture in normal occlusion; that of the bulldog showed not only decided dental irregularity from the standpoint of occlusion, but also mandibular protrusion due to arrest of development of the premaxillary region. The speaker then drew attention to the similarity of the degeneracy of the bulldog skull to the well-marked class of cases found in the human subject where similar arrest of the development of the naso-maxillary region has brought about a lessening of the area of the nasal orifice with a tendency to mouth-breathing and a catarrhal condition of the nasal passages

and the naso-pharynx,—a condition quite commonly found in the bulldog.

Besides the lantern illustrations, specimens of the crania referred to were exhibited, also the head of a bulldog at birth, showing the jaws in apparently normal occlusion, indicating that the degeneracy manifested in the animal's dental apparatus became decidedly more marked as the dog attained adult development.

A patient exhibiting marked mandibular protrusion was also presented for examination and diagnosis as to the etiology of his mandibular deformity, and for suggestions as to treatment.

Discussion.

Dr. BRADY said he thought the cause of this class of irregularities could be explained by the fact that the development of the upper and lower jaws was independent of each other. The bones of the upper jaw articulating with each other made their development dependent on each other, and any influence affecting one would affect them all. It was not so with the lower, as it had no direct connection with the other bones of the face so far as its development was concerned, receiving its blood and nerve supply from a different source. He said any disturbance of the nerve or blood supply to any of the bones of the face could easily exert an influence on the development of the upper jaw.

Dr. CRYER said that Dr. Brady was mistaken in saying that the blood and nerve supply of the upper and lower jaws were independent of each other, as they received both their blood and nerve supply from practically the same source. He then gave in detail the source of both the nerve and blood supply of both jaws.

Dr. ANGLE said he appreciated the points advanced by Dr. Kirk, and was sure they would be the cause of the consideration of the subject from his point of view. As to the case of mandibular protrusion exhibited by Dr. Kirk, he said it was one of the most pronounced cases of the kind he had ever seen. He believed it was a case in which the lower jaw was over-developed and there was

some lack of development in the upper. He said these cases when taken in hand early in life could be successfully treated, but they were very difficult in adult life. It was one case in which he believed extraction was advisable.

Dr. KIRK, in closing the discussion, said he thought the cause of this irregularity was due to several different influences, and his object in presenting the paper was to impress the importance of considering the subject from the point of view of comparative anatomy and pathology, believing that the matter had not been studied sufficiently to place these cases in a definite class, as in all probability they were brought about by a combination of influences not yet fully understood.

The meeting then adjourned until two o'clock.

THIRD DAY—*Afternoon Session.*

The meeting was called to order by the president. The vice-president then took the chair, and

Dr. E. H. ANGLE, St. Louis, read a paper, an abstract of which follows:

ART IN RELATION TO ORTHODONTIA.

The essayist laid special stress on the necessity for the orthodontist to study nature under all conditions; watching patients while in their offices, studying the different expressions in order to cultivate the faculty of reproducing nature. He said it was necessary for the orthodontist to study continually the relation of the different portions of the face in order to be able to produce harmony of the features. He did not believe that influences of heredity were such as to produce teeth that the alveolus was unable to accommodate, as some anatomists taught. He did not believe in extraction, but impressed the idea that the most harmonious results could be obtained by retaining all the teeth, and putting them in proper occlusal relations and to harmonize them with the other features of the face. He described many

cases of upper and lower protrusion in which by careful study and good judgment the arches could be made to harmonize very easily with the other features by the drawing back of the one or the bringing forward of the other. He did not believe it was ever necessary to extract four incisors or molars to harmonize the features, and held that this practice inevitably resulted in disturbing the occlusal relations of the teeth. By the use of the lantern he illustrated many seemingly hopeless cases in which he had obtained beautiful results.

Discussion.

Dr. SUMMA said he believed many mistakes were made in extracting teeth for the correction of irregularities from the fact that so many men did not know what occlusion meant. He believed that only the best results could be obtained from the recognition of the principle laid down by Dr. Angle that the normal typical occlusion must be established, and this could never be obtained by extraction.

Dr. WATSON said he believed a good many cases of irregularity were caused from injudicious extraction, and that some of the most difficult cases he had ever handled were from this cause. There were cases in which extraction was advisable, but they were exceptionally rare.

ELECTION OF OFFICERS.

After the discussion of this paper, the society proceeded to the election of officers for the ensuing year, resulting as follows: Milton T. Watson, Detroit, Mich., president; Lloyd S. Lourie, Chicago, Ill., vice-president; Anna Hopkins, St. Louis, Mo., secretary. Board of Censors—Richard Summa, St. Louis, Mo.; H. E. Lindas, Larned, Kan.; F. M. Castro, Columbus, Ohio. Committee on History and Invention—E. A. Bogue, New York, N. Y.; W. J. Brady, Iowa City, Iowa; Lloyd S. Lourie, Chicago, Ill.

The session then adjourned until the next annual meeting.

UNION CONVENTION OF THE SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

THE thirty-fourth annual union convention of the Seventh and Eighth District Dental Societies of the State of New York was held in the Colonial parlors of the Genesee Hotel, Buffalo, N. Y., October 28 and 29, 1902.

FIRST DAY—*Morning Session.*

The convention was called to order at 10 o'clock, by Dr. G. B. Scott, Buffalo, president of the Eighth District Society. The president made his annual address, and the minutes of the last meeting were read by Dr. C. F. Bunbury, Rochester, secretary of the Seventh District Society, and were approved.

The report of the Business Committee was the next order of business, and Dr. R. Murray, Buffalo, said the committee offered as its report up to the present time the program as printed.

After asking the members to register in the book placed in the hall for that purpose, the president adjourned the convention until 2 P.M.

FIRST DAY—*Afternoon Session.*

The meeting was called to order by the president at 2 P.M.

Dr. F. A. BALLACHEY, Buffalo, read a paper entitled, "Do We Use the All-Gold Shell Crown Too Much?" (This paper is printed at page 109 of this issue of the COSMOS.)

Discussion.

Dr. A. E. MIMMACK, Buffalo. I think the essayist has covered the ground very nicely. We all run across such cases as he describes. I have seen many cases where extraction was necessary, and where looseness of the teeth had occurred simply from a crown having been pushed below the gum, irritating the tissues and thereby causing subsequent trouble. I have found some cases where the teeth had become loosened from this cause and could not be saved even after the crown had been removed and the tooth treated. I do not advocate crown-

ing when a tooth can be saved by filling. A short time ago I found a molar crowned with about two-thirds of the root exposed, gums receded owing to the crown having impinged upon the gums, and in putting on the crown cement was forced down under the gums. I was satisfied that the tooth could have been saved by filling. The crown was ill-fitting, and an attempt to treat it and save it proved fruitless, so that I had to take the tooth out. I have several other cases equally interesting.

I believe that many teeth that are now sacrificed in crowning could be saved by filling; at least a filling could be tried first, and if that failed a crown could be used as the last resort. In a filling there is nothing impinging upon the gums and nothing forced below the gums. At times we see crowns that are very beautiful and we can see no irritation resulting from their presence, but they are very rare. The gums are shaped to fit around the teeth, and forcing anything under the gums will almost invariably cause irritation of the tissues. I remember several years ago Dr. Boswell speaking of crowns in which the band did not go under the gums, but simply to the edge; I thought possibly it would be a good practice, although I have never tried it. It seems to me that where we have the band clear from the gum edge, it would be better than recklessly forcing it underneath the gum. For my part, I resort to amalgam restoration a great deal for cases of this kind, and believe this to be more beneficial, and you then have nothing impinging upon the gum.

Dr. C. W. STANTON, Buffalo. It seems to me that the question resolves itself down to one proposition: Are crowns put on right or not? That is what it all amounts to. Dr. Mimmack says that in fillings we never have anything impinging on the gum or anything forced under it; I am afraid that this statement will not bear close investiga-

tion. Dr. Savage told me once that he had lost one of his best patients because of not being able to properly finish up a filling under the gum, which caused periostitis later and extraction finally. I have had several cases in my own practice where fragments of amalgam had gotten under the gum and set up irritation. It is true that the path of the crown is strewn with wrecks, but it is a compliment to crown and bridge work when we consider that it has survived the large number of wrecks it had to pass through in the first ten or fifteen years of its history; and it shows that there is excellence in crown and bridge work. I admit that it is resorted to too recklessly by incompetent men, but covering up a badly broken-down molar with a gold shell is good practice if properly and conscientiously done. The practice of restoring with amalgam is good and I favor it very much, but in some cases I prefer the crown. When you build up a badly broken-down molar with amalgam you have from one-half to one and one-half inches of margin there where decay will very readily set up again, and I contend that when you cover that with a crown you have a better condition. I do not think that crown work is a mistake when it is thoroughly and conscientiously done. If we do the best we can, and leave no edges to irritate the gums, we will not have any trouble, and I contend that it is not objectionable practice when it is properly done.

Dr. C. S. BUTLER, Buffalo. As we have several other papers along the same line, I move that the discussion of this paper be deferred until the night session, after hearing Dr. Capon's and Dr. Pearson's papers, and that all be discussed together.

Motion carried.

Dr. J. J. MADDEN, Buffalo, then read his paper (an abstract of which follows) entitled

SURGICAL METHODS IN DAILY PRACTICE.

The essayist described his method of surgical treatment of some complicated diseases of the dental organs. He de-

scribed the twofold function of the pericementum, viz, formation of cementum from its inner surface and formation of bone from its outer surface. He stated that in youth this membrane is well supplied with blood, but as age advances its blood supply is lessened and it becomes thinner and less elastic in character and less resistant to irritating influences whether from systemic or local causes.

He described the case of a woman whose mouth presented every indication of careful attention. Upon examination the upper left second bicuspid was found to be the seat of some pathological disturbance. By grasping the tooth firmly between the finger and thumb the peculiar crepitus noticed in cases of fractured bone could be felt. Further examinations revealed the presence a pus pocket. The case was treated antiseptically, but as there was a recurrence of the trouble six months after, and as a slight elongation of the tooth was observed, the author decided to extract the tooth with the view of replanting it after amputation of the apical end of the root had been performed. This method he recommends in all cases in which the disturbance is of the same nature as the one here described, especially when the tooth shows signs of elongation. He then described his technique of replantation and the antiseptic precautions he uses in connection with this operation. In cases of extrusion of an upper central or lower lateral incisor, and when there is pus at the gingival margin, he recommends the same line of treatment.

Regarding the treatment of alveolar abscess, the essayist stated that in order to avoid the pain incident to the burrowing of the pus through the alveolar process the case should be treated surgically. An anesthetic should be administered and the affected parts exposed and treated antiseptically.

Discussion.

Dr. H. B. HUVER, Buffalo. In speaking of cleaning the roots of teeth in pyorrhea, the essayist says that it is practically impossible to clean the roots of teeth back of the six anterior teeth.

I agree with him that a man of ordinary skill can clean the six anterior teeth, and that it is an extremely difficult matter to clean the teeth back of that; but I also think that it would be a very difficult matter to replant teeth back of the anterior teeth. In pyorrhea, my opinion is that the first essential is to thoroughly cleanse the roots; the second, the washing out of these deposits, which have been removed, from the pockets. The essayist speaks of hydrogen dioxid for this use, but I am inclined to think that more harm than good is done with this agent. It is my experience with hydrogen dioxid that has led me to this conclusion. In treating cases of this character, I found that in those in which it was not used I obtained better results than in those in which it was used. As regards the amputation of diseased roots in the treatment of pyorrhea, I believe it is a good method, but success depends entirely upon the thoroughness of the work. If you leave any portion of the necrosed alveolus you will have trouble afterward.

With regard to his mode of treatment of incipient abscesses, I know that the essayist has good success, and I believe he is quite right in opening into the tissues to relieve the condition instead of waiting until the pus burrows its way through the alveolus, subjecting the patient to three or four days of intense suffering. His practice is to use a general anesthetic in these cases instead of injecting cocain and weakening the membrane, as a general anesthetic enables him to give full vent to what pus is there, without waiting four or five days. In cases of chronic abscess, he is enabled to cleanse the parts more thoroughly and to remove part of the necrosed alveolus. But in cases of this character, I do not agree with him in the use of hydrogen dioxid, for in washing out the abscessed parts it is possible to force micro-organisms farther back into the alveolus. I think the technique suggested is about the same as we all are accustomed to in similar work.

The retaining appliance is something new, although that part of the operation

is not so important, as we all use whatever we think best for each individual case.

In cases of replantation, the essayist tells us the mode of preparing the tooth, but has said nothing about the socket. If the socket be not properly prepared, it makes no difference how thoroughly the root is prepared, you will have a failure. With regard to the practice of filling root-canals immediately in his treatment of abscesses, I have followed this practice for several years, and have had good success with it.

Dr. F. J. CAPON, Toronto. I indorse a great deal that the essayist has said, but in some points I think he is rather radical. The extraction and replantation of teeth has been gone over so thoroughly by others, and the percentage of successes has been so slight, that I do not think I would sacrifice the chance of a tooth getting well by extracting it and putting it back. It is yet to be determined whether it is a success or not. There was a time when the profession was greatly wrought up on the subject of transplantation, replantation, and implantation, and if you will ask one of the men who did much of this work his opinion concerning it, he will tell you that he would prefer to give the tooth a chance for its life by leaving it in the socket.

With regard to root-amputation, I thoroughly indorse such a procedure when necessary. There are cases of chronic abscesses in which this method will prove successful where treating through the tooth would have done no good at all. You simply have to go to the bottom of the trouble and clean it out. It is simply caries of the bone, and you must remove it. I have treated many cases in this manner and have had good results. After the necrosed bone is removed, you have to take steps to set up granulation, and your success is almost certain. Dr. Huver's remark about hydrogen dioxid reminded me that I heard that same remark a few weeks ago from Dr. Brophy of Chicago. He said he had almost abandoned the use of this agent in treating abscesses for the same

reason that Dr. Huver gave—that is, the danger of forcing pus corpuscles into the bone tissues, and causing greater trouble later. I have been more careful since then in the use of that agent. I think that opinion, coming from a man who is doing a great deal of surgical work, should be considered carefully in this work.

Dr. L. MEISBURGER, Buffalo. I did not hear the paper, but I would like to say a few words on some points brought out by Dr. Huver in his discussion. I do not see why our patients should have to suffer for twenty-four and forty-eight hours waiting for an abscess to develop. We can do things to hasten the process and considerably lessen the length of time intervening between the forming of an abscess and the final breaking. I have found it good practice to open into many cases of abscess by simply going through the process, enlarging with a large bur, and cutting out what diseased bone was present. I have never found it necessary to resort to general anesthesia for that work. By using trichloracetic acid I can get down through the soft tissues, and then open through the process and cut out the necrosed bone without any special trouble. I have never deemed it necessary to use a general anesthetic for that purpose. With regard to replantation, I have never tried that, but I have a case on hand in which I am going to try it this week.

I do not agree with what Dr. Huver said in regard to hydrogen dioxid. I use hydrogen dioxid to a great extent, and have yet to have any bad results from its use. I use it a great deal in abscesses.

Dr. HUVER. In the bone or in the tooth?

Dr. MEISBURGER. I have never yet opened up an abscess without using hydrogen dioxid. I am not so easily frightened as Dr. Capon, and I have not given it up yet.

Dr. CAPON. I did not say that I had given it up. I said I was more careful in its use.

Dr. STANTON. I would like to ask

Dr. Capon if he ever had any bad results from its use.

Dr. CAPON. I have not myself. The idea occurred to me as having something in it, and I am more careful in its use than previously.

Dr. MADDEN. In presenting this paper for your consideration the point that I had in mind was to bring your attention especially to that double function of the peridental membrane—its ability under certain conditions to construct cementum on the one surface and also to form osseous material by the action of the osteoblasts. From this fact, and also the fact that the tendency of present-day surgery in the treatment of inflammatory conditions is toward radical treatment, I gathered the thought that I present to-day, that of relieving the condition of these tissues before the suppuration should be carried to such an extent as to lower the vitality of the adjoining tissues, as well as to produce stasis and engorgement in the vessels of the peridental membrane.

Dr. Capon made the remark that many men had found from experience that operations of this nature did not prove successful, and that few advocated it in the present day except in special cases, and the whole question settles itself down to the question of judgment.

Now, I do not at all advocate that this operation should be done recklessly and in a haphazard sort of way. I believe, though, that in many instances, by calling into use this double function of the peridental membrane, and interfering with these conditions before molecular decomposition goes too far, much good can be accomplished in this particular line. The upper lateral incisor is the tooth that has more especially attracted my attention in this work, and I have operated on many of these teeth, and they are in the mouth to-day as clean and firm as any of the teeth, and the surrounding tissues look much better than in other parts of the mouth. The question is that this absorption and disintegration is not a slow but a rapid process, and it is this rapid process that

we should stop, and change the whole condition of affairs and stimulate new tissue to form. It may not be the peridental membrane that forms the new tissue; the tooth may become ankylosed, but whatever formation does take place will give good results. In cases where the membrane is affected for any length of time, a careful examination will reveal that malposition of the tooth will set up more inflammation.

In the use of hydrogen dioxid in these cases I am inclined to agree with Dr. Capon and Dr. Huver, that it is not the best practice to throw hydrogen dioxid into tissue of this character. The condition of the tissues is such that there is a liability of forcing infectious matter farther into the tissue and causing trouble later.

Dr. MEISBURGER. Do you use it in open wounds?

Dr. MADDEN. In this particular case that I referred to in the paper, the wound was swabbed out instead of being washed. In the case of an alveolar abscess where there is considerable breaking of the tissue and the infection extends over quite an area, I do not think the use of hydrogen dioxid bad practice.

In presenting this method of treatment of pyorrhea, my idea was to bring your attention to the fact that there is less liability of infecting the surrounding parts than in the use of instruments for cleaning the teeth. We often find pus pockets on the lingual surfaces of these teeth, and in cleaning them there is great liability of infecting the surrounding parts. My principal point in the paper was in cases of this kind to change the conditions and bring about a healthy condition without subjecting the parts to the liability of further infection.

Dr. F. W. PROSEUS, Rochester. I would like to ask the essayist, In cases of this kind where you remove the tooth, do you clean off all the membrane attached to it? If not, why not? If so, why? Why do you groove the tooth before replacing it?

Dr. MADDEN. The tooth must be thoroughly scaled and put in a surgically clean condition to insure a success of the operation. The object in grooving around the tooth is that when the circulation begins again, and the embryonic tissue begins to form, a more ready attachment will be afforded than in case of a perfectly smooth surface. As the serum of the blood pours around the root, the healing process will not be interfered with if the parts are kept in an immovable condition as referred to in the paper. In speaking of the amputation of a root, Dr. Meisburger said he did not see the necessity of using a general anesthetic. In work of that kind, I believe it is best to be prepared to do more than one at first thinks is necessary. I believe it is best to anticipate further work in these cases, and if it be necessary it can be proceeded with without the worry of the patient, and one can make as radical an operation as he thinks necessary.

Another point in reference to the crib for holding the teeth in place. Where the tooth is somewhat turned in the socket, to correct this an impression may be taken and a plaster model made, and the tooth cut from the model and placed in the proper relation to the other teeth, and the crib made to fit the teeth in this position. Whenever it is found that the socket is not deep enough for the tooth to be placed back in its proper position, the end of the root can be cut off to allow it to go back. It is very important that the tooth should be held firm in the socket to allow the new attachment to be formed without interference.

The subject was passed, and

Dr. R. H. HOFHEINZ, Rochester, read a paper entitled "A Few Thoughts." (Printed in full in January issue of the *Cosmos*, at page 31.)

Discussion.

Dr. BUTLER. In reference to his first model, where he has a typical case of pyorrhea with absolutely perfect occlusion, I believe thoroughly in the idea presented by Dr. Brown that pyorrhea

is often due to malocclusion, and I think that point is beautifully illustrated in the model which he referred to as perfect occlusion. If Dr. Hofheinz will examine the model he will find that the lower canines are not in line. I apprehend that when the patient attempts to occlude the teeth there is a force upon that tooth greater than on any other tooth in the mouth, consequently that tooth for a long time has been required to receive largely the impact of the entire occlusion.

I may thus illustrate the influence of irritation as regarding this particular cause: Not long ago I had a similar case to this where only one tooth in the entire mouth was affected, and the other teeth gave no semblance of pyorrhea. The occlusion was fairly good, particularly on the tooth affected, and I began to suspect that it came from other than systemic affection, and in endeavoring to cleanse this tooth perfectly, at the second or third sitting, to my great astonishment I removed a piece of wood fiber which in all probability had been there for months. I had regarded it as precisely a case of true pyorrhea. Soon after the removal of the irritant the tooth healed and became as healthy and normal as the others. So it is not always safe to conclude that it is a case of true pyorrhea. It may be due to malocclusion or irritation.

One point in regard to inlays. I think it was about twenty-five years ago that Dr. Straw of Newburg began to practice on this line—setting inlays with gutta-percha around the margins to prevent the dissolving of the cement, and in the last few years I have seen some of these cases—approximal cavities in bicuspid and molars—doing excellent service. I have done a considerable amount of that work myself, and it has been my practice to smear the edges of the inlay with chloro-percha. I have not used them on labial surfaces, but think it would be an excellent place for them especially where the decay extends under the gum margin. I hope Dr. Hofheinz in calling attention to this character of work has so impressed it upon the general profession

that if they have not undertaken such operations they will do so in the future. It has been one of the most effective things in my practice under certain conditions. Where there are large approximal cavities in bicuspid, in which gold or amalgam would only serve to protect the tooth for a short time, this method is very excellent, because it enables you to fill two-thirds of the entire cavity, and possibly more, with cement, which strengthens the tooth and gives the same appearance as a gold filling.

Dr. CAPON. I enjoyed the paper very much, and was especially interested when the essayist began to speak on the subject of porcelain inlays, because the first time I met Dr. Hofheinz it was in a discussion of a paper read by me three years ago on this same subject, and he put some very pointed questions to me on this subject of retentive material for these inlays. The principal difficulty in retaining these small labial and approximal fillings is in not getting sufficient depth to the cavity. I invariably use in these small cavities on the labial surfaces the How system of inlays. I was favorably impressed with it when Dr. How first brought it out, and have used nothing else for small cavities when I could get the porcelain reamers or burs to cover the cavity, because I trust these more than any other kind. A young lady was in my office not a great while ago who had some of this work in her mouth that I had forgotten I had put in. It was done somewhere about the year 1888, and it is there now, as satisfactory as when I first put it in. I have done such satisfactory work of this character that I have decided it is the best for small cavities where there is no unnecessary loss of tissue.

I want to lay especial stress on the depth of the cavity. I think the secret of retaining inlays is in getting sufficient depth to give body to the cement to hold the inlay. Some of you will doubtless remember a paper read by me several years ago, in which I said that if we had insoluble cement the porcelain inlay would be the ideal filling, because it answers all the requirements of shape,

density, and form, except for the weakness in the retentive material. When we get insoluble cement we shall have attained the ideal of the profession. It is the coming work, and I would advise you to begin using it at once. They are taking it up in Chicago and elsewhere. Dr. Walsen and Dr. Reeves say they hardly use anything else. I do not advocate it quite so strongly as that.

Dr. HOFHEINZ. What is your objection to it.

Dr. CAPON. I do not care to take the responsibility with the cements we have at present. I have been doing this work for fourteen years, and have had some good results. I have used nearly all the cements—Ames', Ash's, Harvard, Justi's, and others—and Justi's has given me the best results. There are many mouths that are not the place for cement; it dissolves out too readily. Mouths in which the cement is not so easily dissolved are the ones for inlays. Dr. Van Woert, in discussing this subject some years ago, said that he had a case where a cement filling had been in for twenty-three years. I said that was just the place for porcelain. I think inlays are the thing for some mouths, but in some mouths it is too easily dissolved out. It is especially good work for weak patients that cannot stand the strain of a tedious operation.

Dr. F. E. HOWARD, Buffalo. I would like to ask Dr. Hofheinz's opinion as to why pyorrhea located itself on that bicuspid and did not affect any of the other teeth of the mouth—whether it was due to accident to the tooth, or was from some other irritating cause.

With regard to inlays, Dr. Hofheinz tells us that he uses Harvard cement exclusively. In my opinion, if we are going to set a large case of bridge work with bands around the roots, there is nothing equal to Harvard cement. It is very adhesive; takes hold upon the smooth surfaces of gold, and also takes hold of the smooth surfaces of the dentin, and will hold a bridge case better than any cement that I know of. On the other hand, if I were going to set an inlay, or make a filling of plastic ma-

terial, or set a crown that did not have a band around the root, I should not use that material. My experience is that it does not stand the action of the secretions of the mouth as well as many other cements we have. There is a great difference in the cements on the market. Many will dissolve very readily, and others will resist to a remarkable degree the action of the fluids of the mouth.

The idea of fastening an inlay with chloro-percha I should not favor very much. I am inclined to think that the chloro-percha would dissolve easily and I would not anticipate good results from it. I think that gutta-percha softened with heat would stand better in the mouth. With regard to making a soft preparation of gutta-percha by using eucalyptus, I should hardly anticipate very much from that, for while it will soften the surface of the gutta-percha so that you can get perfect adaptation, I should not think that it would stand the action of the secretions. I have found in filling roots that, after you have selected a gutta-percha point about the size of the canal, if you will remove and moisten the surfaces with eucalyptus you can pass it up into the root without any trouble and it will take the form of the canal, and you can leave it there with safety, but I would not advocate this method where the material is to be exposed to the action of the secretions.

Dr. F. W. Low, Buffalo. I have had occasion to discuss pyorrhea a good deal in the past two years with my friend Dr. Tom Carpenter of this city. He has devoted a good deal of study to the treatment of pyorrhea, and he says that while he has not been able to demonstrate the fact that pyorrhea is produced by a germ, he is pretty well satisfied of the fact because the symptoms are the same as those of diseases produced by germs. I think, further, that there is great liability to carry the infection from one tooth to another in scaling the teeth.

I would like to ask if anyone has ever used cellulose in setting inlays, and what was the result?

Dr. CAPON. Dr. Perry of New York

experimented a good deal with cellulose. He thought at first that it would be the very material for inlays. He found, however, that it evaporated to such an extent that it would not do for this character of work. Dr. Ottolengui had the same trouble with it. I think Dr. Lamb was the first to experiment along this line. He experimented with cellulose for different kinds of work long before it was on the market. He tried it for inlay work and found it would not do.

Dr. C. E. WETTLAUER, Buffalo. I am experimenting with celluloid along this line, and am using a different method of dissolving from any of which I have ever heard, and I cannot say anything yet as to the success of it. I think I shall be able to accomplish something along this line, and after I have experimented sufficiently to assure me that my method is a success, I will give it to the profession.

Dr. M. B. ESHLEMAN, Buffalo. With regard to the point advanced by Dr. Butler, that there could be no pyorrhea where we have perfect articulation, I agree with Dr. Hofheinz that there are many cases of pyorrhea where we have a perfect occlusion. I can appreciate the fact, because I have several patients with the disease, and I believe their articulation is perfect.

Dr. HOFHEINZ. In regard to the irregularity causing the pyorrhea as Dr. Butler thinks, I cannot see sufficient ground why a slight irregularity should produce such a condition as that. If he will look on the other side of the model he will find exactly the same condition of irregularity as on the left.

Dr. Howard asks what caused this pyorrhea to locate itself on this one tooth, not affecting the others. That is what I want to know. The only way I can explain it is by analogy with the case of a person of gouty diathesis suffering from one swollen finger. With regard to this being true pyorrhea, so far as I know the only distinction between the different kinds is as Dr. Rhein has so properly classed them—pyorrhea simplex and pyorrhea complex: one from a local cause and the other from

systemic. These are the only two that I know. It seems to me that any ordinary observer ought to be able to see that that condition is not being caused by mechanical means. I cannot see how such an influence could warrant such a condition as exists there. I do not believe there is any mechanical reason in the articulation that could produce any such serious condition of pyorrhea.

Dr. HUVER. Was there any deposit on the root?

Dr. HOFHEINZ. Yes. I have been taking off the deposits for two or three years.

In regard to Dr. Butler's using chloro-percha in inlay, did I understand you to state that you have always used chloro-percha on the margin of inlays?

Dr. BUTLER. Not always; usually.

Dr. HOFHEINZ. As to the depth of the cavity, which Dr. Capon has mentioned, I regard it as one of the most essential points. In those cases of mine which have failed, I have attributed it to the fact that I did not have the cavity deep enough.

In regard to the How system of putting in inlays, I have used these in a great many cases of small cavities on the labial and lingual surfaces, and I consider the system excellent for this character of work.

With regard to the insolubility of cements, I do not agree with Dr. Capon. I still believe that the disintegration goes on through the edge of the inlay, and it is for that reason that I have experimented with chloro-percha. I am doing this especially in mouths that dissolve cement readily, and I believe that if we can prevent the edges around the inlay from dissolving, we shall have practically solved the problem of the insolubility of cement. In using eucalyptus I think it will be better for this class of work than chloroform, because it evaporates slowly.

Regarding the danger of carrying infection from one part to another, I do not think it necessary to discuss that, as we all know the necessity of prophylaxis.

The subject was passed.

(To be continued.)

THE DENTAL COSMOS

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Devoted to the Interests of the Profession.

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PHILADELPHIA, FEBRUARY, 1903.

EDITORIAL DEPARTMENT.

ORTHODONTIA AND SPECIALISM.

WE publish in this issue a general account of the second annual meeting of the American Society of Orthodontists, an association whose members are concerned with the study of the problems of dental malocclusion and all that pertains thereto. The meeting was an important one whether measured by the work accomplished or by the motive which animated it, and we take this occasion to make some comments upon both these features, because they are representative of a point of view which may readily, if indeed it has not already, become the nucleus of a development in dentistry having far-reaching consequences.

No one will question the high character and value of the work accomplished by this body of practitioners; in fact, it is only through specialism in a certain sense that the best results in work can be accomplished at all. Specialism means concentration upon a given problem or work,—an intensified effort brought to bear upon a selected field; under which circumstances, other things being equal, the quality and quantity of the resulting product is markedly improved. But other things are not always equal, and the danger of creating sub-specialties in dentistry lies not so much in concentration of effort in a certain field as in the implied exclusion of all else in dentistry from the attention of the operator, narrowing his view and crippling him intellectually. Specialists are not born, as poets are said to be, but are made; they are in the true sense the product of careful training. The tendency of young, untrained, but enthusiastic men to do special work before they have been broadly educated in the general features of their professional work in all its departments can never produce the best grade of practitioner.

It is unfortunately the tendency of many to endeavor to make short cuts to success. Dazzled by the attainments of the few who have gained fame and possibly competence by the earnest cultivation of a specialty, the raw recruit, fired by ambition untempered by experience or wisdom, attempts to attain the same end by the simple announcement that he is a specialist in some chosen field. Two kinds of harm are thus done—one to himself and the public, and the other to the specialty he has failed to either honor or advance.

Dentistry itself is a specialty,—a large and comprehensive one, it is true, but still not so large so far as its general principles are concerned as to place it beyond the grasp of a mind of average fitness and intelligence; and we hold that no man is fitted to practice dentistry at all, with safety to the public health or with hope of success for himself, until he has had a thorough foundation training in all of the basal principles upon which dentistry rests. His college course is supposed to furnish this elementary training, and so it does, but it cannot in any degree supply the intellectual understanding nor the ripening effect that thoughtful consideration and experience tend in the course of time to transform into that quality of character called culture. After the acquisition of knowledge comes a period of digestion and later the assimilation of the mental pabulum, as in the case of physical food, and, to carry the analogy still farther, we have with the mind as with the body that condition of complete nutrition and growth which we call culture in the one case and normal health in the other. We contend, therefore, that any tendency to create specialists out of the mentally well-fed but incompletely nourished recent products of the college course is to make them out of unsuitable material, and would tend to produce practitioners developed only on one side.

It may be contended that it is only on one side that the specialist is expected to practice, but we regard that as a specious but delusive form of argument. Viewed in its broad sense, specialism is normally an outgrowth of the general; it implies, and in the present case it necessitates, a prior general culture in order that it may have a stable and virile existence.

We favor the practice of orthodontia as a specialty if need be, but only in the light of the view which we have here attempted to present of what a specialty should mean. No department of dentistry calls for a more general culture than that which would be in constant requisition for the intelligent practice of orthodontia. The whole question of the etiology of malocclusion is almost a *terra incognita*; the work of a very few investigators is letting in a little light on this profoundly obscure problem, but even now it is evident that it involves some of the most intricate questions in biology and general pathology. Without the ultimate solution of the etiology of malocclusion in its various aspects therapeutic measures must necessarily be empirical and defective, and that just in proportion as its etiology lacks recognition. Again, in its pathological relations to the various tissues and sinuses which are the

adnexa of the teeth and oral cavity, orthodontia presents many points of intimate contact with other special fields of study which necessitate the broadest kind of fundamental training to intelligently meet; and further, the practice of orthodontia as a specialty must include a comprehensive understanding and sympathetic appreciation of the variations in physical status and nervous organization of the patients who are the subjects of this special dental treatment,—a kind of perceptive sense that will enable the operator to wisely calculate the amount of nervous and physical strain to which he may safely subject his patients, a quality of mind that is developed only by long training and observation after a broad education in all the fundamentals of the science of healing.

If orthodontia is to ultimately become a recognized specialty of dentistry, let the educational approaches to it be safeguarded so that the incompetent will be excluded, and none be admitted whose elementary training in dentistry has not been the broadest obtainable and thereafter ripened by the experience of practice supplemented by special study to fit him for this important work.

ODONTOGRAPHIC MEETING IN CHICAGO.

WE have published in this and our previous issues the official notice of the fifteenth annual meeting of the Odontographic Society of Chicago, to be held February 16th and 17th. The movement which has aimed to make this one of the greatest dental meetings ever held in America seems about to be crowned with success. Reports which have reached us from reliable sources place the estimate of probable attendance as nearly or quite equal to that of the World's Columbian Dental Congress, if indeed it may not exceed that number.

The program is arranged to embrace features in the way of clinics, exhibits, and papers covering the whole field of dentistry in its latest development. We urgently commend this great opportunity for social and educational ends to the favorable consideration of all our readers who can possibly arrange to attend. It is an occasion not to be lost and one which will well repay the sacrifice of time and money spent thereon. The railroad companies have arranged for reduced transportation on the basis of one-and-a-third fare for the round trip on the certificate plan, and are offering other special inducements to parties traveling as a body.

The generous hospitality of our Chicago colleagues is too well known to require more than this reference, and for the good of dentistry, the personal advantages both social and professional, and as a mark of fraternal appreciation of this splendid effort, we hope that all who can possibly do so will reserve the time and aid by their presence in making this meeting the success it ought to be and will be.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Dental Summary*, December, 1902.]

THE MANAGEMENT OF NON-ERUPTION OF TEETH. BY STUART LEROY MCCURDY, PITTSBURG, PA.

The author states that occasionally teeth fail to erupt from some fault of the development of the tooth-germ. The process of budding may be in the wrong direction, and the tooth grow upward or to one side, and some obstruction may interfere with normal eruption, and instead of the crown pushing its way through the alveolus it grows in the opposite direction. The general surgeon is frequently on the lookout for sarcoma, exostoma, etc., and seldom sees a dentigerous cyst or tumor due to non-eruption. Dr. McCurdy says that it is always advisable in bone tumors about the face to pass a drill through them before operation is begun, to exclude the possibility of a dentigerous cyst. Instances of this nature have been observed by the writer, and many cases of this kind are on record. Discharging sinuses through the maxilla or mandible are not always evidences of disease of the antrum or other sinuses or of osteomyelitis or tubercular bone disease. These sinuses are not infrequently the result of non-erupted teeth. Indeed, all sinuses giving a very chronic history, associated with slight or no pain when the sinus is open, extending over a period of years are more likely to be caused by non-eruption than destructive bone-disease.

The author describes three very interesting cases in which the inflammatory disturbances were due to the presence of non-erupted teeth. One of these cases was that of a young woman, aged twenty, who had been suffering pain in the region of the upper molars since her twelfth year. She knew that her second molars had not erupted, and was of the opinion that it had something to do with her suffering. This appeared to be quite evident. Operation was advised, and under chloroform an incision was made from the first molar back along the course of the alveolus. The incision was extended down to the bone, and the soft tissues, including periosteum and mucous membrane, were dissected back from the alveolar ridge so as to permit freedom in further operation. The tooth was found partially covered with bone, which was chiseled away and the tooth was prized from its posi-

tion with a bone-elevator. The crown of the tooth pointed directly forward, resting against the first molar. The roots projected slightly downward, parallel with the long axis of the alveolus. The operation on the other side was exactly the same, and the tooth was found in the same position. The flaps were adjusted and secured with catgut sutures. The wounds healed without complication.

The author states that this in an unusual case because of the bilateral condition, the teeth on both sides having been in the same position.

[*Medical Record*, New York, Dec. 20, 1902.]

INSTRUCTIONS TO PATIENTS AFFECTED WITH SYPHILIS AND GONORRHEA. BY FALLEN CABOT.

In this interesting communication, Dr. Cabot insists that patients suffering from venereal disease should be given definite instructions concerning it, and in saying this he includes dispensary cases. He provides each patient with a card on which appropriate instructions are given. On the card which he delivers to syphilitic patients he states among other things that the teeth should be brushed night and morning, and that the mouth should be kept thoroughly clean. He says that if any bad teeth be present they should be treated by the dentist, and emphasizes the fact that the dental operator should be told that the patient is afflicted with such disease, so that he may take the necessary precautions to avoid the possibility of infecting other patients.

[*American Journal of the Medical Sciences*, Philadelphia, November, 1902.]

THE ANATOMY OF THE OPERATION OF REACHING THE ETHMOIDAL CELLS THROUGH THE ANTRUM. BY HARRIS PEYTON MOSHER, M.D., ASSISTANT IN ANATOMY, HARVARD UNIVERSITY.

The essayist states that in working over some anatomical material, his attention was called to the ease with which the ethmoidal cells, especially the middle and the posterior ones, could be reached from the antrum through the upper part of its inner wall, from which, indeed, not only could these cells be opened, but the sphenoidal sinus as well.

In 1897 Jansen reported a case of suppuration of the sphenoidal sinus, which he had treated through the antrum. If the antrum be opened from the canine fossa and the upper part of its inner wall along the line of the junction of the inner wall and the roof of the antrum be examined, the following structures will be found: The first quarter of an inch of the wall marks the outer boundary of the lachrymal canal. The position of the canal is often indicated by a swelling. Just internal to this, or, if there be no swelling present, one-quarter to three-eighths of an inch toward the surface is situated the ostium. The ostium in some cases may be as much as half an inch internally, but three-eighths of an inch will usually clear the lachrymal canal. Beyond the ostium the upper part of the inner wall of the antrum is almost entirely membranous, except for the paper-like process of the ethmoid (the uncinata), which projects downward and strengthens it. In ten per cent. of the cases the antrum has a second ostium which has no definite position. A knife, entered at the ostium, inclined horizontally as much as the opening in the canine fossa permits, and carried directly backward, would cut only the membranous part of the wall, except of course this unimportant process of the ethmoid, and would bring up against the maxillary process of the palate bone. The incision so made is about one-half of an inch long; no vessels of any size are cut. The inner wall of the antrum hangs like a curtain from the lower part of the inner angle of the orbit. It is then stated that a curette entered through the ostium inclined toward the septum and carried back to this incision would strike first the ethmoid bulla with the rest of the middle ethmoid cells, then the posterior cells, and finally the anterior wall of the sphenoidal.

Unless the reader be perfectly familiar with the anatomy of the various air-cells found in the different bones of the face, the above description will be very confusing. It is doubtless for this reason that the author has intercalated in the text six diagrammatic illustrations. If from his anatomical observations the author has reached the conclusion that combined empyemata of the antrum and of the middle ethmoidal cells should be treated through the course here described, it would have been advisable to illustrate his report with the anatomical specimens used in the course of his observations. The use of diagrammatic illustrations, while useful in the sense that it facilitates the understanding of a given method, may become misleading, and it generally happens that *in natura* the rela-

tions of structures differ widely from their relations as represented by diagrams.

[*La Stomatologia*, Milan, Italy.]

A CASE OF DOUBLE TONGUE. (EDITORIAL.)

The editor of *La Stomatologia* calls attention to a case of this rare deformity found in a child five years of age. The rudimentary tongue is situated beneath the normal organ, and is about an inch in length. The antero-posterior diameter is larger than the lateral diameter. The organ is covered with mucous membrane and seems to be composed of normal tissue. It can move, and it does not interfere in any way with the functions of the normal tongue.

[*Internat. Journ. of Surgery*, New York, December 1902.]

A BRILLIANT OPERATION. (EDITORIAL.)

An engineer on the Illinois Central Railway was struck on the left side of the face by a mail crane while looking out of his cab window. As a result, there was gradual but complete ankylosis of the jaw. A tooth was removed and the man was being fed with liquid food. In order to remedy these distressing conditions, Dr. Wyeth, of the New York Polyclinic, decided to perform an operation. He made an incision which began just a little anterior to and about on a line with the lowest point of the ear, and extended to a point near the angle of the jaw.

Upon exposing the tissues it was found that there had been a fracture of the coronoid process of the mandible, and that the ankylosis was caused by the resulting callus.

A second incision about one inch in length was made over the malar bone, beginning on a line with the outer canthus of the eye, running toward the ear, and about on a level with its upper border. The periosteum was elevated and considerable bone formation was removed by the use of chisel and biting forceps. The callus that had formed upon the coronoid process was firmly attached and had become a part of the surrounding tissues, and was not disturbed. As soon as the section was completed, the jaw was released and its function restored. In making the section as high as possible the operator had two objects in view—to keep above and away from the nutrient canal of the mandible and its contents, and to leave a small stump of the coronoid for service.

Not a single ligature was used in this operation, and seven days after the surgical intervention the dressing was removed and the patient was able to masticate.

[*l'Odontologie*, Paris, October 30, 1902.]

BUCCO-LINGUAL LEUKOPLAKIA. BY
PROFESSOR AUG. MARIE, PARIS, FRANCE.

The author prefers to designate this disturbance by the name *Leukokeratosis*, as this word refers to both the clinical aspect and the histological lesion. The disease manifests itself at first by an erythematous phase, which is followed soon after by the appearance of mucous plaques, at first of a bluish white color but gradually becoming of a lighter hue. When the disturbance reaches its full development it never presents the same appearance, as this is modified according to the region which is the seat of the disease. If the different changes in the evolution and the varied etiology of leukoplakia are taken into consideration, it becomes difficult to refer to it as a definite morbid condition. It is only after examining a considerable number of patients that it becomes possible to obtain an idea as to the character of the disturbance in question. In some patients the tongue is almost completely covered by a layer of hard, thick, white, and polished material, with fissures, grooves, and exulcerations at different points. The patient experiences acute pain, especially so when taking irritating draughts, or when food material comes in contact with any of these grooves. In some points the plaques are very well defined and limited. Their margins seem to be detached from the body of the plaque, but the plaque itself cannot be removed, as it adheres to the subjacent tissue. If the gingival mucous membrane be examined, lesions of a similar nature are sometimes found, but more often they are limited to the mucous membrane of the cheeks. It is here that partial desquamation seems to occur more frequently than upon the tongue. The lamellæ become detached spontaneously in the form of small bands. Patients often fail to observe these lesions, inasmuch as they are not the cause of pain or annoyance of any sort, and it sometimes happens that they never find out that they are the subjects of leukoplakia, as the disturbance is at times very slight and remains so for an indefinite period, especially when the person is sober, hygienic, and not addicted to the use of tobacco.

The writer divides leukoplakia into two forms—that which affects the tongue in particular and that which becomes localized in preference upon the mucous membrane of the lips and cheeks. The latter variety may be due to the irritating action of tobacco, while the first, viz, lingual leukoplakia, is generally induced by a syphilitic taint.

With reference to the etiology of leukoplakia, Dr. Marie states that it is rather doubtful, and that, of all the predisposing causes that have been brought forward, the most active is certainly the use of tobacco. He knows of persons who cannot smoke at all, as the smoking of a cigar, or even a cigarette, is followed by a slight case of leukoplakia. To the use of highly spiced food, alcohol, and the presence of rough edges, either in the natural teeth or in artificial substitutes, can also be ascribed the production of leukoplakia buccalis. As, however, the conditions that have been enumerated are sometimes present in many persons without causing leukoplakia, it becomes evident at once that other causes must contribute to the production of this disease. Hereditary predisposition is the factor to which he alludes, and this is created by biliary or renal lithiasis, diabetes, gout, obesity, and by disturbances of the digestive apparatus. Syphilis is the most important cause, especially in the lingual form of leukoplakia. The evolution of this pathological manifestation is the most important part of its anatomical and clinical history. It has a tendency to degenerate into epithelioma. Histologically, the leukoplakial plate is a papilloma, and cases are on record in which, after its removal by the surgeon, it recurred in the form of papilloma.

The prognosis depends entirely upon the care and attention which the patient will exercise, especially with reference to the abstention from tobacco and irritating beverages or food. The author calls attention to the fact that the cauterization of lesions is a dangerous procedure, as the irritation thereby induced may cause the disease to acquire a malignant character. If the lesion becomes the seat of epithelial degeneration, it will present symptoms characteristic of cancerous formation. The plaques become indurated, the patient complains of shooting pain in the region of the ear, and lastly the submaxillary glands become tumefied and their consistence becomes markedly harder than it was previous to the onset of the disturbance. It is, however, worthy of note that leukoplakial epithelioma is less serious in character and less rapid in its evolution than the other forms of cancer, and recurrence of the disease is also less frequent.

As far as treatment is concerned, it is stated that the plaques should be removed by surgical means and that the attention of the practitioner should be directed especially to hygienic treatment; the condition of the teeth should be improved as much as possible, and if the patient wears artificial appliances it

should be ascertained that they are not the cause of any irritation to the mucous membrane.

[*Deutsche Monatsschrift Zahnheilkunde*, Leipzig, 1902.]

ARSENICAL APPLICATIONS IN CERVICAL CAVITIES. BY DR. BUSCH.

When arsenic is to be applied in cervical cavities, Dr. Busch recommends a method which consists in first applying a small quantity of amalgam against the cervical wall and close to the gum. The caustic application is then placed against the pulp and is covered with a small quantity of amalgam of very soft consistence. This is then protected with a pellet of cotton impregnated with sandarac. It is claimed that this filling is easily removed, and that it prevents completely the escape of any arsenic from the cavity. In extensive caries on labial surfaces he employs the same method. He winds a ligature around the tooth several times to prevent the sandaracked cotton from being displaced.

[The plan here suggested by Dr. Busch is not in accord with the method of practice adopted in this country for this kind of cases. The application of arsenic in the proximity of the gingivæ is a dangerous procedure, and the accepted method of drilling a separate pit for the arsenical application when it is difficult to hermetically seal the devitalizing compound in the existing cavity is certainly a safer and better plan.—ED.]

[*Items of Interest*, January 1903.]

A DENTAL PHENOMENON. BY JOHN R. BEACH, CLARKSVILLE, TENN.

The author describes a very interesting and peculiar case inasmuch as it refers to a lower third molar that had erupted externally, showing a well-formed crown through the face. Its position was about midway between the angle of the mandible and the coronoid process. The crown had every appearance of being a *dens sapientiæ*, the gingival margin being substituted by a reddened cutaneous attachment. The patient was a colored woman, twenty-two years of age, of tubercular and syphilitic diatheses. The author gives the complete history of the case, and states that the tooth remained in this position for several years before it was extracted. The right side of the face, which has been swollen for a considerable time because of inflammatory disturbances, remains apparently in the same condition, and a facial distortion is very noticeable. There is a drawn appearance of the chin and lower lip

to the right, the mental symphysis being about half an inch to the right of the median line. If the mandible is forced to the left, the swollen appearance is lessened and the contour of the face becomes nearly normal.

[*Dominion Dental Journal*, Toronto, September, 1902.]

ORAL SECRETIONS AND THEIR RELATION TO DISEASE. BY WM. GOLDIE, M.D., TORONTO.

In using the name "oral secretions," the author says that he does so with a purpose, for the term "saliva" conveys an idea of a secretion of a special and single character, whereas the fluid of the oral cavity is composite, and coming as it does from the three large paired glands and those innumerable microscopic glands situated in the mucous membrane,—such a fluid, made up of the secretion of glands of so different types must be extremely variable, for not only do they contain different substances and different percentages of the same substances, but they differ as to the time, the rate of flow, and the duration of the secretion.

Discussing the nature of the various gland cells, the author says that they are divided into two classes, albuminous and mucous. The albuminous cell secretes the more watery part of the oral fluids, the active ferment ptyalin, and small amounts of organic compounds and inorganic salts. They are found in greatest number in the parotid glands, fewer in the submaxillary glands, while in the sublingual glands they are but few in number in the mucous cells that form the bulk of these structures. The small tubular or racemose glands of the lining membrane of the mouth are composed solely of mucous cells. These mucous cells excrete the larger percentage of organic substances, inorganic salts, and mucin, the substance to which the viscosity of the secretion is due.

The author pays special attention to the cells that line the glands, insisting upon the necessity of studying these cells in order to be able to account for some of the pathological variations in this secretion. He gives a few data regarding the chemical composition of saliva, and says that there are reasons to doubt whether mucin is a simple substance, as there exists in the fresh secretion a kind of mucin which has a globular or mass form, never becoming thoroughly mixed with the rest of the fluid unless exposed for some time to the action of an alkaline medium. In the ordinary secretion, or that of slight alkalinity, it tends to keep its minute globular form and

settles down as a whitish deposit of sticky nature. He asks whether these minute masses may not be a nidus for the calcium salts in the formation of tartar. As to the variations in the secretion, he says that the amount of blood supply, the rapidity of the flow, the dilution of the blood, and the presence of certain substances, will of necessity cause variations in the composition and quantity of the secretion.

Dr. Goldie then takes up the question of the influence of nervous stimulation (cerebro-spinal, and sympathetic nerves) upon the oral secretion, also the conditions under which it is possible to have a greatly increased or continuous flow of secretion, and those that tend to bring about a decrease in the secretion.

Abnormal substances, the essayist says, are rarely present in saliva, except when certain drugs which have been administered are found, in small quantities usually, or very exceptionally abnormal constituents occur in certain diseases, urea sometimes being present in certain cases of nephritis.

Dr. Goldie has certainly overlooked the findings of important investigators regarding the constant presence of urea in the saliva, which has been estimated to be twenty times less than in the urine (Michaels). Pettenkoffer, in 1848, found urea in the saliva, and estimated the quantity at 0.45 per cent. These experiments were confirmed by Picard and Rabuteau, there being, however, some difference as to the proportion of urea found by these different investigators. Further, it is stated that the relative changes which may occur in the oral secretion are dependent on the amount of water excreted. It is certainly surprising that it should be only to the amount of water excreted that the author attributes changes in the character of the salivary secretion, as Viellard, Binet, Michaels, and others have shown that the saliva, "like all the recrementitious secretions, is modifiable according to the physiological oscillations and in constant relation to the humors of the body."

Regarding the concentration of the secretion, he says that it will vary according to the activity of the blood supply and to the force of the nerve stimuli. The less the blood supply and the stronger the stimuli, the more concentrated will the secretion be.

The author believes that no variation in amount or percentage composition bears any definite relation to disease, and that such variation may or may not indicate the state of general health, with the exception of persistent ropy saliva, which, he says, depends upon an increased proportion of mucin or les-

ened alkalinity, or upon a combination of these factors.

Referring to the saliva as a medium for the development of bacteria, he says that the clear alkaline secretion, uncontaminated by any food material, does for a very short time lessen the number of bacteria introduced, afterward allowing a very slow and limited growth; but that if mucin is present in relatively large proportions it is found that the multiplication is very rapid, and not only is there greater growth, but a change is produced aiding bacteria to adhere to the teeth.

From the general character of this essay, it seems that both in the preparation of his paper and in his investigations the author has not taken into consideration the researches previously made by authorities on this question in Europe as well as in this country; and it is scarcely necessary to prove the inaccuracy of his statement with reference to the relation between the amount and percentage of composition of the saliva and diseased conditions. Dr. Michaels of Paris, in his epoch-making essay on "Sialo-Semeiology," presented at the Third International Dental Congress, claims—bringing forth proofs in support of his now widely accepted opinion—that the slightest deviation from a condition of health is indicated in the saliva by some special change or changes which may affect either its composition or its physical properties.

[*Deutsche med. Wochenschrift.*]

POISONING WITH SUPRARENAL SOLUTION. BY DR. OTTO VON FURTH, PRIV.-DOCENT PHYSIOL. CHEM., UNIV. STRASSB.

The essayist calls attention to a case of injection of suprarenal solution which was followed by toxic phenomena. The injection was performed in order to arrest hemorrhage incident to urethrotomy. The hemorrhage was arrested immediately, but the patient fainted and suffered from convulsions that lasted for several hours. Dr. Von Furth calls attention to the fact that intravenous injections of small doses of suprarenal solution in animals have caused toxic phenomena, and states that subcutaneous injections are likewise followed by these toxic and dangerous symptoms. He therefore says that the use of suprarenal preparations in dentistry should certainly be carried out with caution until further experiments shall have determined the exact *modus operandi* to be followed in cases of this nature. He also refers to other cases of poisoning caused by the use in various ways of suprarenal preparations.

PERISCOPE.

Give the Hypochondriac two drams of sodium sulfate three or four times a day.—*Med. Summary.*

Mix Your Porcelain with Distilled Water.—In mixing porcelain body for inlays or crown work always use alcohol or distilled water. All hydrant water is liable to contain some mineral in solution.—*Dominion Dental Journal.*

Supernumerary Uvula.—Dr. Jos. Mullen, of Houston, Texas, depicts (*Laryngoscope* for May 1902) a case of this anomaly in a male negro, twenty-five years of age, well developed and in apparently good health.—*Amer. Journ. of the Med. Sciences.*

How to Remove a Matrix from a Porcelain Inlay.—To remove a matrix from an inlay, immerse it in alcohol after baking and the gold or platinum matrix can be torn off without endangering the thin margin.—*Dominion Dental Journal.*

Household Ammonia for Cleansing the Hands.—To clean the hands after doing laboratory work, keep a bottle of household ammonia at hand and pour a dram into the basin of water used for washing the hands. The result will be magical.—*Dominion Dental Journal.*

Bleaching Pink Rubber.—I have found that the quickest way to bleach pink rubber is to focus upon it the rays of the magnifying glass, taking care not to burn it. This method gives you a beautifully bleached pink in about five minutes.—L. ARNDT, *Dental Register.*

A Polisher for Rubber Work.—Procure a piece of fair leather, heavy and stiff, cut disks one inch in diameter and trim to a knife-edge, cutting a hole in the center for the lathe chuck. This is very efficient for polishing between teeth and places hard of access.—J. A. ROCKEY, *Dental Brief.*

For Desquamation of the Tongue.—

R—Cocain hydrochlorid, 7 grains;

Balsam of Peru,

Boric acid, āā 15 grains;

Vaseline, 10 drams. M.

Sig.—Apply on the tongue twice daily.

—BESNIER, *l'Odontologie.*

Electric Bath.—The electric bath is one of the newest things, although it isn't a bath at all. A thick rope is entwined with wires, and this is donned. Then a current of electricity is switched on, and the wearer of the electrical robe soon finds his body getting warmer, until in a little while he perspires as freely as if he were in a Turkish bath.—*Med. Times.*

Detection of Formaldehyd.—Professor Brundage gives a simple and convenient test, in his "Manual of Toxicology," as follows: Dissolve a decigram of morphin in 1 c.c. of sulfuric acid; gently add, without mixing, an equal volume of the suspected liquid; if there be any formaldehyd present the liquid will soon assume a reddish violet color.—*Amer. Druggist and Pharm. Record.*

Canal Cleanser a Valuable Instrument.—A Donaldson canal cleanser is a very valuable instrument, not only for removing a pulp intact, but, in conjunction with pyrozone, for removing the disorganized remains of the pulp in a tooth already dead, and for scraping the sides of such a canal. I have found sizes No. 5 and "medium" to be the most serviceable.—W. M. WHITLOCK, *Internat. Dental Journal.*

Carbonized Cotton an Excellent Root-Filling for Temporary Teeth.—Carbonized cotton makes an excellent root-filling for the temporary teeth. Its softness and non-irritating qualities especially adapt it for this class of work. It should be placed very lightly in the canals, so as to cause no pressure to the periapical tissue. The use of strong antiseptics should, moreover, be avoided.—A. JESSEL, *Dental Review.*

Sterilization of Septic Cavities.—The mere fact that it is impossible to thoroughly sterilize some of the cavities of the body is no excuse for not doing as much as possible in this direction before operating upon them. Thorough washing out at any rate removes the excess of bacteria and of secretions favoring their development, and improves the facilities for obtaining good drainage.—*Internat. Journ. of Surgery.*

Ptyalism from Small Mercurial Doses.—In a communication on "Calomel, Acids, and Ptyalism" in the *Therapeutic Gazette*, Dr. J. E. McIntyre states that one-quarter of a grain

of calomel, if it be allowed to remain in the body, is just as capable of producing ptialism as three or four grains. He watches small doses with a greater degree of apprehension than larger ones, and states that mercurials should be always followed by a good active saline laxative.

Artificial Cinnamon Oil.—A Leipzig firm of essential oil dealers have taken out a patent for the preparation of artificial cinnamon oil, depending on the mixing together of such of its constituents as have so far been detected. These bodies are cinnamic aldehyd, amyl-methyl ketone, nonyl aldehyd, cumic aldehyd, caryophyllene, linalol and its isobutyl ester, cymene, benzaldehyd, phenyl-propyl aldehyd, furfurol, pinene, and eugenol-methyl ether.—*Chemist and Druggist*.

Number of British Soldiers Invalided for Defective Teeth.—The number of men invalided home from South Africa for defective teeth during the war is officially stated to have been 2451. It appears that the subject of improving the dental condition of the rank and file is receiving careful consideration. Appointments of dentists were made during the war, and the War Office is now awaiting the result of certain experimental measures that have been adopted.—*Chemist and Druggist*.

Usefulness of a Large Spoon-Shaped Excavator.—An instrument which I value highly is a large spoon-shaped excavator. I have quite frequently had men say to me, "Where do you use that? It is too large to do anything with." This is one of the most useful instruments in my office; it may be used in removing decay from very large cavities, for removing tartar, and also for scraping down cement fillings. It is an all-round useful instrument, although at first sight many will think it too large to be of any use whatever.—J. A. WATLING, *Dental Register*.

Deviation of Mandible from Side Affected by Injury.—In injuries about the lower jaw, affecting one side at or above the level of the angle, as after a severe blow from a fist, there is often a slight deviation of the jaw away from the affected side. This might lead one at first to think of partial dislocation, were it not for the fact that the jaw can easily be pushed toward the median line. The cause lies in the fact that the muscles on the injured side are relaxed as much as possible by the patient, owing to the pain caused by their contraction after an injury.—*Internat. Journ. of Surgery*.

To Remove Plaster of Paris from the Hands.—Sugar placed in water, or the use of simple syrup, will greatly facilitate the removal of plaster of Paris from the hands, after applying plaster dressings. The use of sweet oil is also serviceable for this purpose.—*International Journal of Surgery*.

Vinegar or oxalic-acid solution will also do the work satisfactorily. The vinegar, especially, leaving the skin soft and pliable and entirely free from the harshness which the plaster leaves after washing the hands in plain soap and water.—MILES F. PORTER, *Ft. Wayne Journal Magazine*.

Treatment of Facial Deformity due to Upper Prognathism.—In the case of an excessive overbite due to abnormal development of the maxilla or want of development of the mandible, as the case may be, the upper teeth, being the more frequently lost or attacked by caries, more often call for attention. The teeth can with advantage be all extracted in the upper jaw, to encourage the absorption of the maxilla, and special attention may be paid to the lower teeth and roots to preserve them and prevent absorption of the mandible, which commonly in these cases is more or less undeveloped.—GEO. S. BONALIE, *Dental Record*.

Adrenalin Chlorid, a new form of that most powerful hemostatic, the suprarenal gland, is indeed a most useful addition to our materia medica. It is 1:1000 solution of the gland in a normal salt solution containing 0.05 of chloretone. This makes a solution which can be kept for months in an aseptic condition, and with the chloretone added has the advantage of producing some anesthesia. Its uses are too well known to need mentioning; suffice it to say that the preparation has been found a great help as an astringent and styptic, and together with orthoform it makes a bloodless and painless operation about the gums possible.—*Exchange*.

Disadvantages of Low-Fusing Porcelain.—One of the disadvantages of low-fusing porcelain is its tendency under fire to become spherical. For this reason, apart from its lack of the necessary amount of resistance under stress, it does not appear suitable for extensive restoration or for general use in crown and bridge work. The greatly increased amount of shrinkage which it exhibits, as compared with high-fusing porcelain, is not in itself of so much importance as its tendency to lose its form and destroy the artis-

tic work which may have been expended upon it, and its further objectionable liability in some cases to absorb secretions and change color.—*Dental Review*.

Diagnosis of Pulp-Sensitivity by the Thermal Test.—The thermal test, unless applied in accordance with the observations published in the "American Text-Book of Operative Dentistry," is useful only for purposes of rough diagnosis. The method of applying the thermal test suggested by Dr. Louis Jack is accurate only in the light of a previous record of the normal temperature reaction of the teeth, which normal has been found by him to vary for each individual; hence for the purposes of diagnosis under the conditions presenting in a dental college clinic, where patients are not under continuous observation, it is practically difficult.—E. C. KIRK, *Penn Dental Journal*.

Old Age a Contra-indication to Serious Operations.—Among the conditions almost always enumerated as contra-indicating serious operations is old age. There are certain very good reasons for this. A person who has lived many years has had relatively more opportunity to impair his various organs than one who has lived a shorter time. Moreover, the tissues in themselves are old, and especially the bloodvessels have lost much of their elasticity. On the other hand, we must bear in mind that the fact that these persons have attained great age would indicate that they were primarily well made or that their normal resources had been well preserved.—A. J. OCHSNER, *Internat. Journ. of Surgery*.

Iron Oxid Added to Oxyphosphate Cements Increase their Resistance.—The ordinary zinc oxyphosphate filling is so temporary that any change in its composition which will make it more durable is important. I have found a number of cements which have more lasting properties. One of these has now been tested for nearly twenty-five years. To make it, add iron oxid in the form of the finest rouge to the zinc oxid in the proportion of one part of the former to six to ten of the latter. The color is dark red, but this is no objection to its use in many places. The mixture may be quickly produced by shaking the two powders together in a test tube.—WILLIAM ROLLINS, *Internat. Dental Journal*.

The Root-Canal Filling "par excellence."—Years ago I came to the conclusion that there could be no more pernicious material for the filling of roots than cotton, however well

it might be saturated with antiseptics. Accordingly I began a series of experiments with zinc oxychlorid, as being presumably the most manageable and least objectionable material. After an experience of nearly thirty years I am able to assert that a root-canal, whatever its original condition may have been, which has been brought into a healthy condition, and perfectly filled with zinc oxychlorid, retains its color and its health and is absolutely destitute of the faintest odor if you cut it out twenty-five years afterward.—N. S. JENKINS, *Dental Review*.

The X Ray in Determining the Limits of the Frontal Sinus.—Dr. John Howard Philip, of San Francisco, recommends (*Journ. Amer. Med. Assoc.*, March 22, 1902) this method of determining the character of the diseased sinus before operation, and illustrates his remarks with a reproduction from a radiograph taken for that purpose at the San Francisco Polyclinic. In view of the fact that there are no frontal sinuses in a great many individuals—in some series of autopsies as many as fourteen per cent. being without—this preliminary investigation would, as suggested by Dr. Philip, prevent injury to cranial contents in such cases when about to be operated upon for supposed disease of the sinus.—*Amer. Journ. of the Med. Sciences*.

Something About Tin and Gold Fillings.—The distress caused a patient by the insertion of a large gold filling in a molar or bicuspid is often held up as a very marked objection to such operations by those who are either too lazy or incompetent to do such work. The only extra suffering given to a patient in inserting a tin and gold filling, as against amalgam, is the difference in time in the actual packing of the two filling materials. The preparation of the cavity should be the same, the matrix should be used, the finish the same, and the rubber dam adjusted. This difference is not so very great with those who have had some experience, and one is fully repaid because of the much better filling inserted.—A. E. WEBSTER, *Dominion Dental Journal*.

The Therapeutic Uses of Gelatin.—We have on several occasions called attention to the remarkable hemostatic properties of gelatin when injected into the circulation or administered by the mouth. It exerts a marked effect in promoting the plasticity of the blood in the curious condition known as hemophilia, and according to Dr. Lancereaux, of Paris, it

is also productive of benefit in albuminuria and diabetes. Unfortunately, the effect only lasts so long as treatment is maintained, but as the doses of gelatin required are comparatively small, and as it is devoid of any collateral effects of a disagreeable nature, there is no obvious reason why its use should not be persevered with in the same way as that of thyroid extract in myxedema.—*Med. Press and Circular*.

Dental Care during Pregnancy.—R. C. Newton (*International Dental Journal*) states that certain dentists decline to fill or clean the teeth of pregnant women, thinking that this will bring on a miscarriage. While it is perfectly conceivable that dental work might bring on a miscarriage, I believe that it has rarely done so, and in the vast majority of cases it is far better to preserve the teeth of a pregnant woman by doing the necessary work for her than to allow the caries to go on until after the confinement is over, and so not only subject the woman to the risk of losing the teeth altogether, but also add to the gastronomic discomfort and indigestion from which a pregnant woman generally suffers, by leaving decayed and probably painful teeth in her mouth.

Diagnosis of Malignant Tumors.—In connection with the diagnosis of malignant tumors I would caution, very emphatically, against applying much pressure to the surfaces of these growths. I have observed many cases of carcinoma—of the breast, for instance—which had remained almost stationary for many months until the patient began to have it examined. Each successive examining physician and all the patient's friends had thoroughly massaged the tumor during repeated examinations, and it seems reasonable to suppose that in this way the rapid increase in size, the involvement of the lymphatic glands, and possibly the metastasis in the liver, could be explained, because of the likelihood of forcing cells from the primary growth into the lymph channels.—A. J. OCHSNER, *Internat. Journal of Surgery*.

Acute Alum Poisoning.—Dr. Julius Kramolik (*Pester med.-chir. Presse*, 1902, No. 11, p. 242) reports the case of a young man, aged thirty years, who by mistake drank a swallow of an approximately ten per cent. solution of alum which he had prepared as a gargle for a sore throat. Neither the mouth nor the throat showed any marked reaction to the irritant, but the patient vomited thirty-nine times within forty-eight hours fol-

lowing the ingestion of the alum. Palpation of the stomach was painful. Mucus was found in the vomitus, mingled with blood, imparting a chocolate color to the mass. The urine was stained by blood, and showed morphologically numerous red blood-cells, few leucocytes, and few hyaline casts. Traces of albumin were also present. The patient was ill for at least thirteen days.—*Amer. Journ. of the Med. Sciences*.

Exceptional Cases in which Low-Fusing Porcelain May be Used.—In the use and application of porcelain for our purposes there are four requirements. The first is that of strength; the second, that of stability of color; then, stability of form; and lastly, translucency. An experience of eight years in the use of both high and low-fusing bodies, beginning with the low and ending with the high, has convinced me conclusively that we have practically no use whatever for any porcelain body that will fuse below 2000° F., with the possible exception of some classes of extensive cavities where it is desirable to construct a porcelain restoration in the posterior portion of the mouth. It may be indicated to some extent in such cases—for the reason, I believe, that it is easier to burnish gold into a difficult cavity, particularly if it be a large one, than to burnish a platinum matrix, and because color is not so important and strength is increased by the additional bulk.—HART J. GOSLEE, *Dental Review*.

Anterior Attachment for Bridge Work.—Where it is necessary to use an anterior tooth as an abutment for a bridge, if the tooth be sound the attachment can be made without sacrificing the labial portion. The pulp is removed and the root filled through an opening made on the lingual surface. The lingual plate of enamel is now ground so that it presents a concave surface, the depth of the concavity depending upon the proximity of the lower teeth when the jaws are closed. Burnish a thin piece of metal (platinum or pure gold of 36 gauge) into the concavity, allowing the edges to extend far enough from the opening to insure a strong shoulder. Insert the pin into the canal through the metal, and after removing the tooth attach with solder, being careful to retain the correct relationship. The solder should be carried to the edge of the metal to strengthen it. This makes a strong attachment for a bridge, as we can insert a longer pin in the root than with the ordinary crown, and by adopting this method we preserve the labial portion of the natural tooth.—*Dental Review*.

Calcium Hypochlorite for Burns.—F. Tichy (*Deutsche med. Woch.*), calls attention to the virtues of calcium hypochlorite as an antiseptic for burns. He applies a cool bandage with oil on the first day, causing vesicles to form quickly. These he opens after twenty-four hours under antiseptic precautions. He then applies compresses steeped in the solution given below, and renewed after twenty-four hours, but kept moist by pouring on fresh solution during that time. It is of importance to leave the compresses on as long as possible and to keep them constantly damp. Great care must be exercised in removing the old compresses, not to disturb the scabs under which the wound is to heal. The solution is as follows:

Take—Calcium hypochlorite, 2.4 to 5 grams (36 to 75 grains);

Distilled water, 990 grams (or 35 ounces);

Dissolve, filter, and add

Spirits of camphor, 5 grams (85 minims).

—*N. Y. Med. Journal.*

Cavities in which the Use of Combination Fillings of Tin and Gold is Indicated.

—It must not be thought that tin and gold is indicated in a very large number of cavities. But where it is indicated it has no peer. In none of the six anterior teeth can it be used, except perhaps a short strip to cover the cervical margin in a cavity that reaches well under the gum. The color and its non-cohesiveness are objections to its use in the anterior teeth. But it is in large, deep, and inaccessible approximal cavities in molars and bicuspid where this material finds its place. Quite true, the material must not show on the buccal walls of bicuspid, but this can be very easily avoided if that side of the cavity be carried up with pure gold, while that portion toward the lingual is made of tin and gold. There seems to be a tendency in this material that is not found in pure gold or amalgam, to spread and squeeze into sharp corners and places difficult of access. It is especially indicated in cavities that go well under the gum, where dryness cannot be absolute.—A. E. WEBSTER, *Dominion Dental Journal.*

Preparing Enamel Margins.—The ideal border is prepared with stones and disks, which should always be used when possible. With them, if of fine grit, the enamel can be highly polished. The disk, of course, can be of advantage in but few cases, while the stone

can be used in almost all positions where enamel burs can be used. Next in effectiveness comes the enamel bur, and a very fine border can be produced with it. Its only disadvantage is that it can be used to cut in only one direction. When held in a certain position, the right side of the border will be cut from without inward, producing a sharp, well-defined border, without clipping at the outer edge. The inner surfaces, of the enamel rods, being supported by the dentin, are not broken; but when the bur is used in the same position on the left side of the cavity, the cut of the bur is from inward outward, and, the outer border of the enamel having no support, it will be broken and chipped, the resulting filling being surrounded by a rough margin,—an ideal place for bacteria to lodge undisturbed and again carry on the process of destruction.—*Exchange.*

Removal of Roughened Apex.—Frederick B. Moorhead (*Dental Era*) says that in cases where the apex of the root has become roughened and the peridental membrane has been destroyed, it should be removed. This may be done with a fissure or large round bur. The edges must be carefully rounded so that there will be no sharp corners to act as an irritant and thus prevent the formation of granulation tissue. The cavity is then packed with iodoform or carbolated gauze. On the second day the packing should be removed and the cavity irrigated with, preferably, a hot saturated solution of boric acid, especially if there be much pain. The cavity is then repacked with carbolated gauze. The subsequent treatment will depend largely upon the amount of tissue removed, and the local and general condition of the patient; as a routine practice, we irrigate and repack every day for ten days or longer. After the swelling and soreness have disappeared a gutta-percha plug may be substituted for the gauze packing. By thus keeping the orifice open, granulation tissue will form at the bottom and soon fill the entire cavity, which in turn will be organized into bone, periosteum, mucous membrane, etc.

Oil of Cassia as an Agent of Tooth-Discoloration.—Truman W. Brophy (*Dental Review*) states that his attention was first called to the discoloration of teeth by the action of oil of cassia by Dr. A. H. Fuller, of St. Louis. He suggested that a tooth would discolor under its action even though its pulp were not exposed. As formerly used for wiping out cavities prior to the insertion of

fillings, oil of cassia would discolor a tooth and cause it to be decidedly darker than its fellow, even though the pulp was not exposed. Moreover, it would produce pulpitis in a tooth into whose cavity it had been inserted, and thereby cause a great deal of discomfort to the patient and sometimes marked congestion and possibly strangulation of the pulp. As to whether that really would occur or not I cannot say, but this much I do know, that it will produce a marked discoloration of a tooth when placed in the cavity although the pulp has not been exposed. As to how to get rid of the discoloration brought about by the action of oil of cassia, and of other agents capable of producing discoloration of the inorganic substances of the teeth, I do not know. It seems to me that would be the most troublesome phase of tooth-discoloration to deal with, and I hardly know what agents could be employed to counteract the effects of cassia, or iodine if you please, if anyone should use them, or any of the substances that are capable of causing discoloration. We know how to destroy or to neutralize some agents, as sulfuretted gases, that find their way into the tubuli as the result of the breaking-up of the tooth-pulp into the elements of which it is composed; yet with that we are sometimes taxed to the utmost.

Therapeutic Application of Carbonized Cotton.—The treatment of gangrenous or abscessed teeth becomes rather a pleasure than otherwise when working with carbonized cotton. I remember very distinctly my first experience with the wonders of this peculiar material. I had been treating a gangrenous upper second molar in a boy of about fourteen. The root-canals were extremely wide and long, and there was a mass of decomposed and foul-smelling pulp tissue in all three canals. I cleansed them mechanically as thoroughly as I could, and used sulfuric acid repeatedly, each time sealing in some of the acid on a bit of ordinary cotton. This treatment was continued daily, but every time the cotton was removed there was the same disagreeable, foul odor. One day, after having treated the case about five or six times, Dr. Förberg happened to come into my room while the boy was in the chair, and I told him about the case. He saw I was using the ordinary cotton for sealing in my acid, and said "Why don't you use the carbonized cotton; that will soon help you." Well, I did as he told me. Next day I saw my patient again, and was quite surprised, not to say dumbfounded, at the lack of any odor other

than that of the sulfuric acid and ether I was using.

This, my first experience of the great value of carbonized cotton in the treatment of teeth, was quite sufficient to establish its reputation in my estimation, and I have never again had any complaint to raise against it. It has stood by my side in my hardest struggles with abscessed teeth, and even buccal fistula, and has proved to be of the greatest value to me as well as to my patients.—A. JESSEL, *Dental Review*.

Disinfection of the Hands by the Use of Essential Oils.—The question of sterilizing the hands has been brought before the medical profession at different and frequent intervals, and while a great number of chemical compounds have been suggested for this purpose, no reference has yet been made to the use of the essential oils. Dr. E. Calvello (*Semaine médicale*) has carried on a series of interesting experiments to determine the bactericidal action of the essential oils. He has experimented with oil of cinnamon, oil of thyme, and oil of geranium, which he has used in the form of emulsions prepared by dissolving one part of the oil in six parts of alcohol, these solutions being added to a quantity of water proportionate to the degree of emulsion it is desired to obtain. The hands of the operator were first infected with cultures of staphylococcus pyogenes aureus and bacterium coli, and were then washed with soap and water for five minutes. They were then plunged into absolute alcohol, after which the emulsion was used and was allowed to remain upon the hands for five minutes.

Dr. Calvello found that the operation of washing the hands with soap and water and the subsequent use of alcohol did not produce a condition of complete asepsis. With 7 and 8 per cent. solutions of oil of cinnamon, with 11 per cent. solutions of oil of thyme, and with 17 per cent. solutions of oil of geranium, the author found that he could bring about a relative disinfection of the hands which could be favorably compared with the results obtained with one per cent. solutions of corrosive sublimate. It is interesting and important to observe the very favorable effects which have followed the experiments of Dr. Calvello, inasmuch as the results obtained with these different solutions are just as effective as those obtained with mercury bichlorid, and further, because the use of the essential oils does not present the disadvantages and inconveniences of the mercuric solution. He found that absolute sterilization can be brought about when the pro-

portion of these emulsions is carried to 9 per cent. for the oil of cinnamon, 12 per cent. for the oil of thyme, and 18 per cent. for the oil of geranium.—J. E.

Chemically Pure Ethyl Chlorid as a General Anesthetic.—The number of cases which have been subjected to general anesthesia with ethyl chlorid, says Vacher (*Ann. des Mal. de l'Oreille, du Larynx, du Nez, et du Pharynx*, June, 1902) can now be counted by the thousands. This comprises the use of the drug in infants, adolescents, adults, and old men. He has not had a single dangerous symptom to discourage him.

It is important that the drug should be chemically pure. A cone is formed and covered with paper, and into this cone from one-half to one dram of ethyl chlorid is poured. This is placed over the patient's nose and mouth, and he is told to breathe deeply. In fifteen to thirty-five seconds complete anesthesia is accomplished without any muscular spasm. If the anesthetic is then withdrawn, recovery takes place within the minute. If the drug is continued there develops a period of contracture, myosis, and abolition of the corneal reflex. In a few seconds more there is complete muscular relaxation. The patient snores. There is mydriasis, but no stenosis. There is no trismus, as is often

observed in the use of ethyl bromid. The anesthesia, which is obtained in thirty or forty seconds at the maximum, lasts from two to three minutes. If a more prolonged anesthesia is needful, a fresh dose of the drug is given as soon as the patient begins to become conscious. Often a small dose may be administered, producing anesthesia for at least ten to fifteen minutes. The recovery is extremely prompt. There is no headache, no vomiting, and in a few minutes the patient is able to get up and walk.

Vacher, if the operations require more than a few minutes, precedes the administration of chloroform by ethyl chlorid, thus obtaining complete narcosis in four minutes, sometimes in three. It has never required more than six minutes. Ethyl chlorid is given for thirty to forty seconds, then the chloroform mask is applied. This entirely suppresses the period of excitement.

Ethyl bromid, which resembles in its action ethyl chlorid, is more easily decomposed, more readily produces cyanosis or trismus, and acts in a more lethal manner upon the bulb. Patients on recovering from it experience hebetude and prostration. The eradication of the bromid requires forty-eight hours, and is signalized by the disappearance of the garlicky odor from the breath.—*Therapeutic Gazette*.

HINTS, QUERIES, AND COMMENTS.

NOMENCLATURE OF CARIOUS PENETRATION.

It is worthy of remark that in only one among the several systems of dental nomenclature that have been brought before the dental profession at different intervals by thoughtful and painstaking writers has reference been made to the manner of designating the degree of penetration of dental caries. At the seventeenth annual session of the American Dental Association, held at Chicago in 1877, Dr. J. Taft moved that a committee of three on the nomenclature and terminology used by the dental profession be appointed. Dr. Taft's motion was carried, and he and Drs. Atkinson and Judd were appointed as such committee. Dr. Atkinson prepared several reports on the subject entrusted to this

committee (see Transactions of the American Dental Association, now the National Dental Association, for 1877-1890), but in none of the several papers read before the above-mentioned association as the result of the committee's work can any reference be found to the question of the nomenclature of carious penetration, which we now venture to bring to the consideration especially of dental teachers, to whom the matter of properly designating the degree of penetration of dental caries, is a matter of vast importance.

Dr. G. V. Black, in connection with his extensive and painstaking work on this subject embodied in his essay on dental nomenclature presented at the World's Columbian Dental Congress (see Transactions, vol. ii), refers to the fact that the practice most common in

our literature is to speak of cavities as superficial, shallow, or deep, but, as he says, these terms give no definite idea regarding the depth of carious cavities. He suggests as a remedy the nomenclature used by some French writers, which differs only slightly from another method which we will now present, and which is the one most prevalent at present among the French members of the dental profession. It consists in classifying caries into four degrees:

Caries of the *first degree* is that in which the enamel alone has become decalcified, the disturbance being limited to the enamel rods.

Caries of the *second degree* is that which affects the enamel and dentin, the pulp being as yet protected by a sound layer of dentin.

Caries of the *third degree* is that in which the carious process has penetrated to the extent of exposing the pulp, this being covered by a softened layer of dentin.

Caries of the *fourth degree* is that in which the pulp has undergone putrefactive decomposition due to the ingress of the micro-organisms concerned in the process of decay.

Paul Dubois, in his "Aide-Mémoire du Chirurgien-Dentiste," Paris, 1889, subdivides the fourth degree of dental caries into five different stages, which could be designated as a matter of convenience as 4¹, 4², 4³, 4⁴, 4⁵. Thus:

4¹. Pulp disturbances of a slight degree, without apparent infection of the canals.

4². Infection of the canals, without affecting the pericementum.

4³. Infection of the canals causing slight pericementitis, subacute or chronic.

4⁴. Slight infection producing slight alveolar disorders, gingival fistula, or alveolar abscess of moderate intensity.

4⁵. Infection of the canals producing serious disorders, acute or chronic, *i.e.* phlegmonous pericementitis; chronic pericementitis, causing profuse suppuration and recession at the gingival margin; cutaneous fistula; pericemental cysts, and reflex disorders.

The manner in which a cavity should be prepared and the technique to be followed in each case depend largely on the degree of penetration of the carious process. A cavity in a tooth in which the decay has progressed to the extent of endangering the life of the pulp will be prepared upon different principles to one in which simply the enamel and possibly the dentin to a slight degree have undergone chemical disintegration. It is for this reason that in teaching methods of cavity preparation special attention should be called to the penetration of the carious process, as this is one among the several factors which determine the operative procedure to be followed in each case. With the aid of the system of nomenclature of carious penetration here suggested, a closely accurate reference to the nature of a given cavity can be made, as the classification embraces not only the carious process, but also the common sequelæ of neglected cases in which the pulp and possibly the pericementum become the seat of infective disturbances.—JULIO ENDELMAN.

OBITUARY.

DR. BYRON RATHBUN.

DIED, at his home in Dunkirk, N. Y., November 13, 1902, Dr. BYRON RATHBUN, M.D.S., after an illness of about three months, in his sixty-eighth year.

Dr. Rathbun was born at Pine Grove, Pa., October 28, 1835. His early education was obtained in the public schools of his native town. At the age of twelve he left his home and worked on a farm for two years, at the end of which time he moved to Erie, Pa., and

entered a printing office as head "devil." While here a trivial incident occurred which shaped his future career and led to his selection of dentistry as a life-work. Being in need of dental services he called upon Dr. Chapin, who was so much pleased with the appearance of the boy that he suggested that he come into his office and study dentistry. After carefully considering the matter he decided to adopt the suggestion, and in August 1851 entered upon his studies.

At this time he had become an expert compositor, and during the two years he was a student in Dr. Chapin's office he continued his work at typesetting at night, thereby earning the means with which to sustain himself. But the strain was too great, and he found himself so broken in health that in 1853 he was obliged to go south, where for three years he sought to regain that which he had lost.

On his return in 1856 he entered into partnership with Dr. C. A. Thompson of Westfield, N. Y., one of the most prominent practitioners of that section, with whom he remained six years. In 1862 by mutual arrangement the partnership was dissolved, Dr. Rathbun going to Dunkirk, where he remained in the continuous practice of his profession until the time of his death,—or, in all, forty years.

He was an active and zealous worker in dental societies, having assisted in the organization of the Lake Erie Dental Association and also in that of the Dental Society of Western New York, in both of which bodies he was an active and influential member. In 1867, at a meeting of the Lake Erie Dental Association, held in Westfield, Dr. Rathbun being the secretary of the meeting, the now venerable Dr. Jonathan Taft of Cincinnati delivered an address on "Popular Dental Education." A resolution prepared and offered by Dr. Rathbun was adopted, calling for a "uniform system of dental education and some legal distinction between the well-instructed and the ignorant practitioner." A committee was appointed to agitate the question, and in October the Dental Association of Western New York adopted a similar resolution and appointed a like committee; in November the Buffalo Dental Association did likewise; and thus, as a result of the agitation started by Dr. Rathbun at Westfield, the splendidly organized Dental Society of the State of New York, with its District Societies, the Ohio State Dental Society, and others followed.

Dr. Rathbun became a charter member of the Eighth District Dental Society and was elected treasurer in 1871, holding that office for three years, when he was elected vice-

president, which office he held for one year. In 1875 he was elected president, and served one year when he was elected censor, and he served on that board continuously until the time of his death. In 1870 he was elected delegate from the Eighth District Dental Society to the Dental Society of the State of New York. In the same year he passed the examination and received the degree of M.D.S. He became a permanent member of the State Society in 1878, and held the office of vice-president in 1886-1887.

In all his professional relations Dr. Rathbun was a man of exemplary character and unusual ability, but of great modesty. In politics he was always a republican, but never obtrusively such, and was again and again elected to represent his ward on the Board of Councilmen, he frequently being the only republican member of that body. He served as chairman of the board, and as such was several times acting mayor of the city. In all his various positions he discharged their respective duties with rare fidelity and conspicuous ability.

He was a devoted and zealous member of St. John's Episcopal Church and a vestryman for many years. He was also a Mason of high degree, being a past commander of Dunkirk Commandery No. 40, in which organization and other Masonic bodies he was held in the highest esteem.

In 1865 Dr. Rathbun was married to Thirza Ann Jillson, who died October 11, 1898. Of this union three children were born, two daughters and one son—Dr. Chauncey M. Rathbun, an honored dentist of Fredonia, N. Y. A loving father, an exemplary citizen, a Christian gentleman, and a beloved member of our profession has fallen.

His remains were accompanied to their last resting-place by a large number of his professional brethren. The burial services were under the auspices of Dunkirk Commandery No. 40, whose beautiful and impressive ceremony, which he had so often helped to perform, seemed especially solemn and appropriate.

C. S. B.

SOCIETY NOTES AND ANNOUNCEMENTS.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-fifth annual meeting of the New York State Dental Society will be held at Albany, N. Y., Wednesday and Thursday, May 13 and 14, 1903.

W. A. WHITE, *Sec'y*, Phelps, N. Y.

VERMONT STATE DENTAL SOCIETY.

THE twenty-seventh annual meeting of the Vermont State Dental Society will be held at the Van Ness House, Burlington, March 18, 19, and 20, 1903.

All members of the profession are cordially invited.

THOS. MOUND, *Sec'y*, Rutland, Vt.

ODONTOGRAPHIC SOCIETY OF CHICAGO.

THE Odontographic Society of Chicago will hold its fifteenth annual meeting February 16 and 17, 1902.

It is the aim to make this a most memorable event in every particular. Papers have been secured from some of the leading men in dentistry, and the subjects selected for discussion are those of the greatest interest to the profession to-day. Two half-days will be devoted to clinics. The exhibitors will be present in full force with all the latest appliances and inventions. Chicago extends a cordial welcome to the profession.

C. N. JOHNSON, *Pres.*,
F. H. ZINN, *Sec'y*.

ODONTOLOGICAL SOCIETY OF WESTERN PENNSYLVANIA.

THE Odontological Society of Western Pennsylvania will meet in Pittsburg, Pa., Tuesday and Wednesday, March 10 and 11, 1903.

It is expected that this will be the largest meeting of any in the history of the society. The executive committee are arranging with some of our best lecturers, as well as a great number of exhibitors, so as to make it the most successful meeting ever enjoyed.

C. B. BRATT, *Pres.*,
B. M. LOAR, *Sec'y*.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING DECEMBER 1902.

December 2.

- No. 714,694, to GUSTAV HOLTZ. Adjustable wall bracket.
- No. 714,901, to JAMES E. HALL. Toothpick.
- No. 714,938, to JOHN A. MCCLELLAND. Dental oven.
- No. 714,983, to CECIL P. WILSON. Dental instrument.
- No. 715,005, to JOHN C. BLAIR. Fountain spittoon.
- No. 715,182, to WILLIAM WAEGEL. Dental flask.
- No. 715,216, to ASHBY A. SHAW and RALPH A. STEVENS. Means for producing dental amalgam.

December 9.

- No. 715,263, to ALB'T HAUSSMANN. Tooth-brush.
- No. 715,422, to MOSES I. RUBIN. Artificial tooth.
- No. 715,447, to JOHN D. WILKENS. Dental plugger.
- No. 715,476, to JAMES P. HARDY. Elevating and controlling mechanism.
- No. 715,492, to HENRY A. LITTIG. Mechanical dentistry.

December 23.

- No. 716,491, to STEWART J. SPENCE. Composition of materials for dentists' or other uses.
- No. 716,676, to HENRY L. CRUTTENDEN. Dental cement injector.
- No. 716,677, to HENRY L. CRUTTENDEN. Collapsible dental cement-injecting tube.
- No. 716,759, to THOMAS DEQ. RICHARDSON. Bottle for putting up tooth, toilet, or other powders.
- No. 716,781, to CLARENCE L. STOCKS. Dental occluder.

December 30.

- No. 717,094, to BYRON W. HAYES. Box tooth crown and adjustable facing.
- No. 717,121, to CHARLES H. RICHARDSON. Adjustable wall bracket.
- No. 717,158, to SAMUEL S. BLOOM. Artificial tooth and anchor.
- No. 717,216, to HENRY B. KENT. Tooth-powder bottle, can, or other container.
- No. 717,402, to THOMAS O. HOLLAND. Tooth-powder receptacle.

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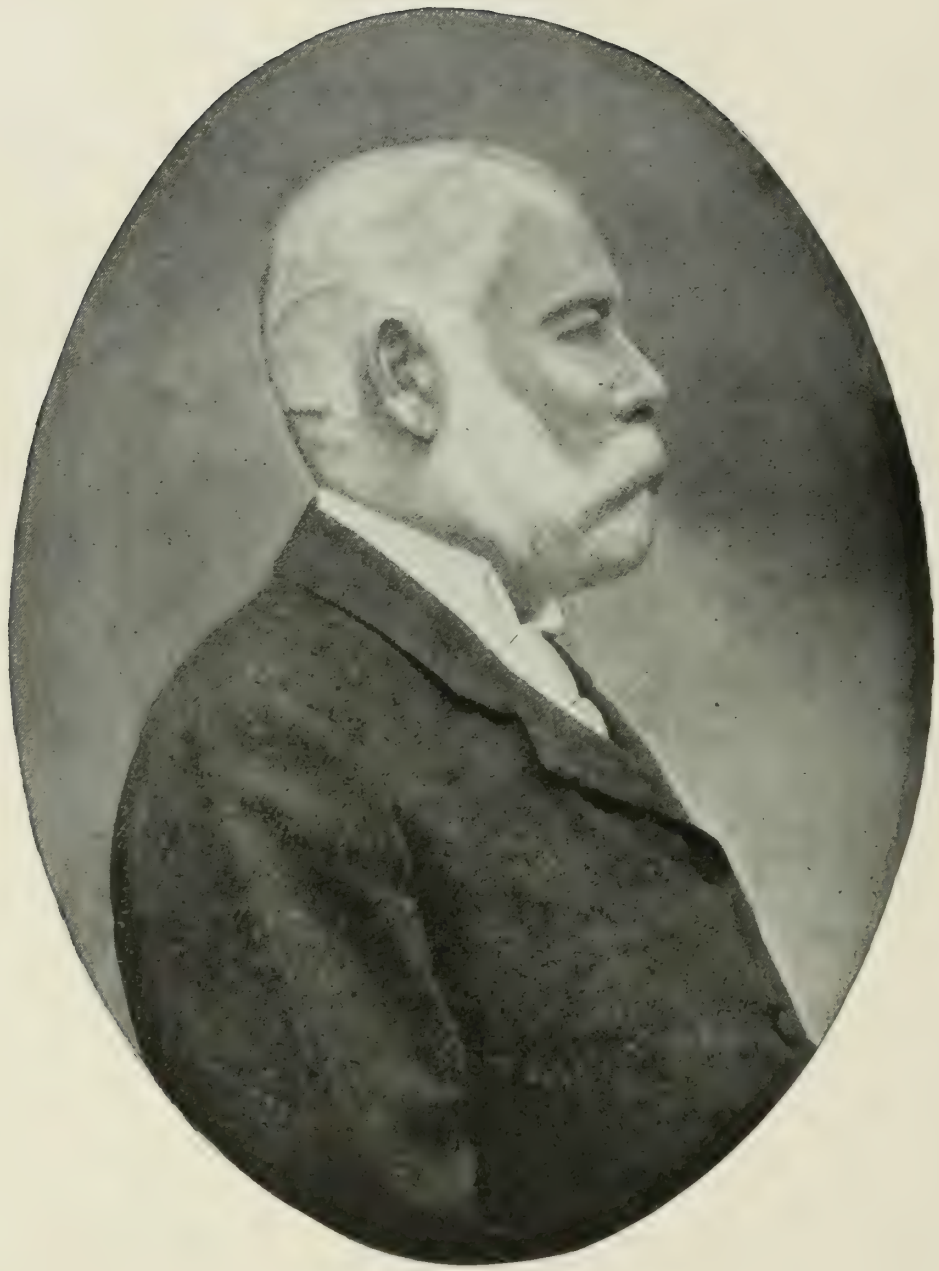
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Yours very truly
H. Jones

THE DENTAL COSMOS.

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MARCH, 1903.

No. 3.

ORIGINAL COMMUNICATIONS.

THE PROFESSIONAL SPIRIT.

By C. N. JOHNSON, L.D.S., D.D.S., Chicago, Ill.

(Read at the joint dinner of the Buffalo Dental Association and the Eighth District Dental Society of New York, January 14, 1903.)

IT would sometimes seem, in the intense activity of thought and effort along material lines manifest in our ranks to-day, that the spirit of true professionalism was in danger of being lost to view. Men are apt to forget the higher essence of their calling when their energies are directed and their attention absorbed in the one aim of materialistic advancement, and there comes a time when it appears necessary to call a halt and take serious stock of our real position and see whether or not we are living up to the best traditions of our craft.

It seems difficult to instil into the minds of many of those practicing dentistry the true significance of what professionalism really is. To be blunt about it, the fact is, a very appreciable number of men in the profession to-day were not born right to begin with. That is, they were not born right for professional men. They might have made good mechanics, or good tailors, or good barbers, or good stonemasons, or good fellows—but not good professional men. It may be added in parenthesis, and without the slightest breach of confidence, that some of them

might have made good politicians. But to be a professional man in the truest sense is something apart from all this. The essence of real professionalism must either be bred in the bone, or at least nurtured assiduously in the development of the individual. Say what we may in our dubious moments, there is a vast distinction between the practice of a profession and the following of a trade or commercial pursuit, though it is true that many in our ranks apparently fail to realize this distinction.

PROFESSIONALISM IN THE COLLEGE COURSE.

The reason that an offensive commercialism is too often found associated with dental practice is because many dentists lack the true professional spirit. They were neither born with the professional instinct nor has their education imparted to them the professional idea. And just here I must pause to consider what I believe to be one of the most important factors connected with the development of professionalism in dentistry. To-day it is safe to say that ninety per cent. of

those entering the profession receive their early impressions of professional matters through the medium of the dental colleges. The number of those seeking admission to practice through other sources than a college course is almost infinitesimal, and so we must look to the college to impart the professional idea to the coming dentist. I am not one of those who flippantly lay all the sins of professional commission or omission at the doors of the colleges, because my association with college men has led me to believe that they are an earnest, conscientious, hard-working body of men. There are black sheep in every fold, but that the large majority of those engaged in teaching in our dental colleges to-day are as lacking in principle as has sometimes been charged I am not quite prepared to accept. And yet it has occasionally occurred to me that it was possible for college men to accomplish more than they are now doing in the way of building up a professional spirit among their graduates. The intense activity and the rapid evolution of methods manifest in teaching students the fundamental and practical branches of dentistry in the last few years have occupied the best energies of the best men to keep pace with the advancement, and if the less tangible though higher phases of mental and moral development have not always received their due consideration it is not altogether to be wondered at. It is true that every well-appointed college has a series of lectures on ethics, and also that high moral principles are sought to be inculcated into the student body at all times, but this is usually only in a general way and not with the specific aim of developing that finer sense of true professionalism which should enter the very life, and color the conduct of every practitioner of dentistry.

DUTY OF THE TEACHER.

College teachers should constantly study their students with the one aim of making professional gentlemen of them, and with this end in view they should never lose an opportunity to emphasize their professional obligations and

to point out the true significance of what professionalism implies. It goes without saying that in order to accomplish anything along this line with a class of students the teacher himself must have a just appreciation of the dignity of his calling, and be a man of the highest moral and mental tone. He must at all times so tinge his remarks that the students are early impressed with the fact that in the study of dentistry they are assuming a different species of obligation from the man learning a trade or following a commercial pursuit. If the teachers in all our colleges will approach their work with the proper professional spirit themselves, it will in the end do much toward developing such a spirit in the rank and file of the profession.

But it may be well to consider for a moment what is involved in the obligations of a professional man aside from those of a tradesman. The one great distinction, as I view it, relates to the question of free service to humanity. It is seldom or never binding on a man engaged in a trade to give his services free of charge, while with the professional man—particularly those associated with the healing art—it is frequently necessary to exert his very best efforts with absolutely no remuneration. A dentist or a physician is obliged at all times to relieve suffering wherever or whenever found entirely regardless of any possible financial return. If a poor mortal is racked with pain, whether he be prince or pauper, the true professional man must use his best skill to relieve the pain without a thought as to any possible reward. This is one of the unwritten obligations with which he binds himself when he elects to follow a profession. The moment he assumes professional status he places himself in such a relationship to humanity at large that the poorest creature in existence has that claim upon him. It was formerly the rule that the professional man performed his work without even estimating financially the value of his services. He simply relieved those in need of his aid as a matter of course, and in the event of receiving remuneration it came to him

voluntarily from the one relieved as an honorarium. This was particularly true in the old days of serfdom, when the slaves of an estate received the same professional care as the master, and at stated times—usually at the end of the year—the master sent the professional man his regular stipend, not as a transaction of barter, but as a voluntary honorary offering. The abolishment of serfdom and the general leveling up of the different classes of society changed the conditions so that a different system became necessary. Under the old system with the new conditions the livelihood of the professional man became too precarious, and so in his own self-defence he was obliged to make a definite charge for his services. This was only proper and just, and yet in this introduction of the commercial element into the professions there was something of the old spirit of true professionalism lost, till to-day the trend in the professions seems dangerously near drifting solely in the direction of commercialism to the utter exclusion of the professional.

BUSINESS AND PROFESSIONALISM.

It is, of course, in strict accordance with equity and justice that a man, professional or otherwise, should gather together sufficient of the world's material goods to insure himself and those dependent upon him from want in old age. In fact, this is something more than his right; it is a solemn and moral duty. But in assuming this common and manifest obligation of life he need not, as many seem to do, lose sight of the higher aspirations which should dominate every man's motives when he assumes to take rank in the world as a member of one of the learned professions. The very learning which he is supposed to possess places him in a relationship to humanity which distinguishes him from other men. The knowledge of the tradesman is more in the nature of common or ordinary knowledge, is not necessarily intricate, mysterious, or unfathomable by the average individual, while that possessed by the professional man is more specialized, profound, and what may be termed

extraordinary. It is essentially knowledge which is not available to the rank and file.

Then, again, another distinction between the tradesman and the professional man is that the former deals with things while the latter deals with persons. If a stonemason lays a brick out of line or a carpenter swings a door the wrong way the mistake is readily recognized by anyone, and the error is not fundamentally disastrous to the welfare of mankind; but let a physician prescribe the wrong drug or a dentist maltreat an alveolar abscess, and no ordinary individual can detect the mistake, while the effect may easily be the jeopardy of human life. This does not imply that the tradesman is not a necessary and useful member of society and entitled to every respect for his skill and utility in performing the various offices assigned to him in the great machinery of the world's work, but merely that the nature of his obligations to humanity is not of the same specialized and intimate character as that of the professional man, nor are his responsibilities so great.

Looking at it from this point of view, it will be seen that the professional man is in need of a different sentiment and that he should be dominated by different impulses from men in other walks of life, and to establish this idea it is necessary to develop in the profession, as the bone and sinew of our professional faith, a spirit of broad humanitarianism which looks only to the greatest good for the greatest number, and which rigidly excludes selfishness of motive or narrowness of purpose.

IMPORTANCE OF ASSOCIATIONS.

To be more specific as to what the true professional spirit may accomplish for us and what its absence may entail upon us, it is only necessary to consider briefly some of the signs of the times in the profession to-day, and study the tendency in the professional lives of some of our members. It must be acknowledged that one of the most potent factors in professional progress is the establishment and maintenance of

professional associations. Dental societies have done more for dentistry than has any other one element in its advancement, and they have unique possibilities for the development and fostering of the professional spirit. But do dental societies always fulfill their highest function as instruments of good in this respect? Some societies undoubtedly do, but many others do not. And to what must we attribute the fact that society work is not always productive of the greatest possible benefit? Mainly to the one factor of personal ambition on the part of the members.

POLITICAL AMBITION.

Ambition is a most excellent thing in a man when it is directed solely to the accomplishment of worthy measures, but when it takes the form of personal aggrandizement, and an itching for office, it is productive only of evil. To be plain about the matter, the influence of politics has done more harm to dentistry than can well be imagined. It does not seem to be enough on the part of some men engaged in society work to take an active and altogether laudable interest in the election to office of men who are capable of conducting the affairs of the organization in a creditable manner, but they must needs stoop to the methods of ward heelers and disreputable political tricksters, to the end that they often convert what is supposed to be a dignified professional meeting into the turmoil of a political fracas. And what is it all for? I confess to as full an appreciation as any of the honor and distinction which comes to a man as the result of high office conferred upon him by his associates—provided it comes in the right way. If a man is made president of his society by virtue of a spontaneous recognition of his worth and fitness for the place, and because he is entitled to it from long service, he may well take a pardonable pride in its acceptance, but if the office carries with it the reeking odor of base political intrigue and dishonest methods, he would better far have a millstone hanged about his neck than that

he should accept such questionable distinction.

And, after all, what is there in the fleeting honor of office to make men stoop so low to obtain it? I often marvel at the egregious folly of men in the profession who work harder at politics than they do to further the scientific interests of their calling. The only lasting reputation a man can make in the profession is to do something to lighten up the dark places in its scientific knowledge, and if all of the energy heretofore worse than wasted on politics had been expended in this direction the profession would have been vastly the better for it. Politics and professionalism are as far apart as the poles, and no one thing has done more to jeopardize the good of societies than has the too frequent introduction of politics into the meetings. Not only this, but it has so tinged the thought of the membership that the spirit of professionalism, instead of growing as it should in this most fertile field, has been choked out and well-nigh smothered by the noxious weed.

The possibilities of the professional spirit in the upbuilding of dentistry cannot be well computed. It is this which imparts to men the impulse to work unselfishly for the common good, to dig out the hidden mysteries of the forces of nature and apply them to the betterment of the profession. It makes a man study for hours in the quiet of his laboratory, late into the night and early in the morning, that he may learn something which shall be of benefit to his fellow man. And if he is a true professional man he does it not for the glory it brings, not for the plaudits of the passing crowd, not that his name may be heralded from one end of the land to the other, but simply that the knowledge he acquires may make the way clearer to his professional associates, and through them may lead to the amelioration of human suffering. The man who works solely for the purpose of making a reputation for himself, no matter how faithfully, or earnestly, or consistently—no matter what the sum total of his achievement may be—has not within him the

true professional spirit. Reputation may come, it often does come, to the man who toils unselfishly for the public good, but the mainspring of his effort must not be impelled by personal aggrandizement, else the purest essence of his work is to that degree tarnished.

INFLUENCE OF PROFESSIONAL SPIRIT ON CHARACTER.

The professional spirit is broadening in its tendencies and takes a man out of the narrow rut of prejudice and self-conceit. It bids him acknowledge merit wherever he finds it, and to give credit wherever credit is due. It makes him welcome the light, no matter by whom it is shed, and to accept a fact even if presented by his worst enemy. The greatest courage I can conceive of in any man is to frankly acknowledge his error when that error is pointed out by some one in opposition to him, and this rare quality in human nature is unerringly imparted to a man by the principle of professional spirit.

Years ago in ancient Galilee we had presented to us the example of a man who gave to this era its present name. Laying aside for the moment the religious sentiment with which his career is usually associated, I am impelled to point him out as the man of all others in the history of the world who typifies what I should like to conceive as the real professional spirit. His example in the attitude he assumed toward his fellow man is something for us to study and to emulate. Not that you or I can ever hope to tune our hearts to the sublime sentiment which filled his soul, not that we can rise entirely superior to the small things of life and bear with such infinite patience as he the buffetings of the motley mob, not that you or I may assume to be in any degree molded in his master mind, but simply that we may with the example of his patience, his humility, his forbearance, and his lovingkindness be pointed to the main essentials of that which I have feebly endeavored to portray as the true professional spirit.

THE IMPORTANCE OF THE FIRST MOLARS IN THEIR RELATION TO ORTHODONTIA.*

By EDWARD H. ANGLE, M.D., D.D.S., St. Louis, Mo.

THE real majesty and importance of the first molars in the dental apparatus is but just beginning to be comprehended by dentists, and thus far to orthodontists their supreme importance has been almost a sealed book. It is the object of this article to arouse a true understanding and keener appreciation of the great value of these teeth, for they are not only the most important teeth in the whole dental apparatus in performing the function of mastication, but they are to a very large extent the molders of the dental apparatus and the locators of all the other teeth. They are also the true

points, and the only true points, from which to begin the study and diagnosis of all cases of malocclusion. They furnish the chief and most reliable anchorage in tooth-movement, as well as being the principal source of retention, and to a very large extent they make or mar facial beauty.

CLASSIFICATION OF MALOCCLUSION.

In the writer's "Treatment of Malocclusion of the Teeth and Fractures of the Maxillæ," sixth edition, it has been shown that malocclusion is not chaotic, but is readily classifiable into a few simple classes. This classification is not ar-

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bitrary, but is really nature's classification, as we shall show, and is due to the relations which the upper and lower first molars assume upon their eruption.

The first molars are in normal relations when the mesio-buccal cusp of the upper occludes between and buccally to the mesio- and disto-buccal cusps of the lower, as shown in the normal occlusion,

arrangement of cusps must result, as in Fig. 1, for the reason that the molars—the formation-point of the permanent occlusion—are correct.

It will now be readily seen that to sacrifice a single tooth would be to destroy not only this arrangement, but the possibility of bringing it about.

If the lower first molars in taking their

FIG. 1.

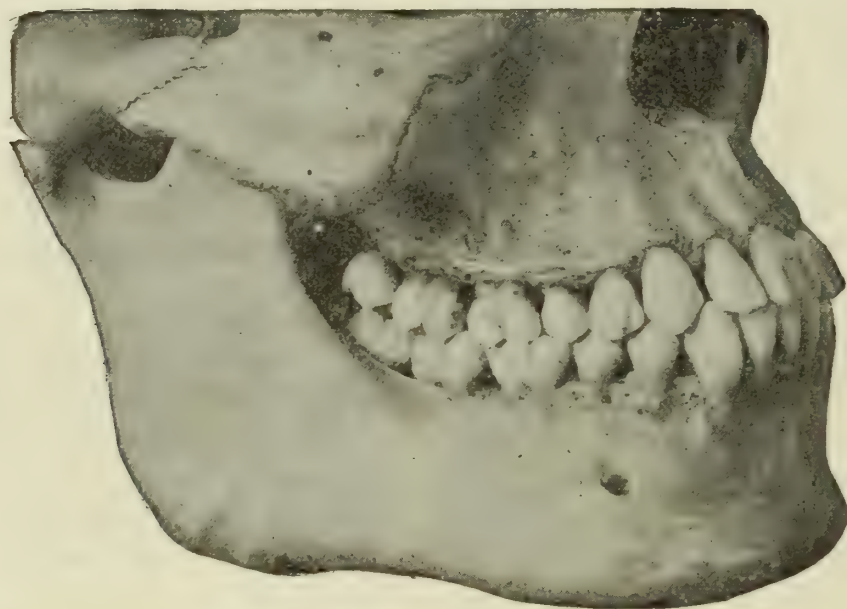
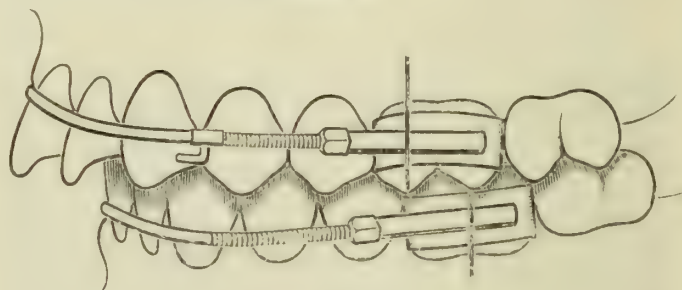


Fig. 1. It is only with this arrangement of the molars—this normal locking of the cusps—that it is *possible* for each subsequent tooth upon its eruption to assume its correct mesio-distal relation. However, the teeth *anterior* to the normally locked molars may—and often do, for causes not now necessary to consider—assume malpositions on their eruption. And just here do we have the dividing line between normal occlusion and malocclusion. We repeat, that only with molars normally locked is normal occlusion of the remaining teeth possible, but having molars normally locked we may and do have malocclusion of any or all of the remaining teeth. Indeed, cases of this kind comprise the majority of malocclusions and I have named it “Class I.”

If the teeth anterior to the normally-locked erupt in malposition the treatment clearly indicated is that they shall be made to assume their normal mesio-distal relations in the arches, when complete harmony as to sizes of arches and

positions should lock with their antagonists distally to normal (or with the mesio-buccal cusp of the lower occluding between the mesio- and disto-buccal cusps of the upper, as in Fig 2), or mesially

FIG. 2.

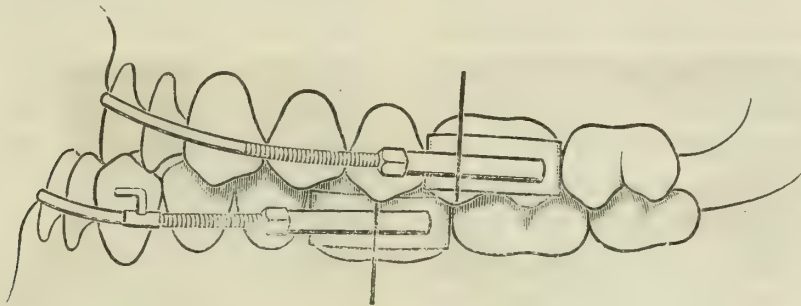


to normal (or with the mesio-buccal cusp of the lower ultimately occluding between the upper first and second bicuspids, as in Fig. 3), the entire misarrangement of all the other teeth must result; as, for example, if they lock one cusp distally to normal, all of the remaining lower teeth in erupting will be forced to take positions of distal occlusion to those of the upper; there will be complete mal-arrangement and maloc-

clusion of each occlusal plane both anterior and posterior to the first molars. We have called this "Class II." It will be seen that this is a natural class, into which all cases in which the first molars are so locked most naturally and unmistakably are grouped.

retention of each tooth found in malposition is plain, and the appliance for accomplishing this, which easily outranks all other appliances for this purpose, is contained in the principle given us by Fauchard many years ago. I have called it the "expansion arch," although

FIG. 3.



If the first molars on one side of the dental arch only are locked in distal occlusion, those on the other side being normally locked, the case naturally falls into a sub-class, and has been termed the "subdivision of Class II."

If, on the other hand, the lower first molars in erupting take their positions *mesially* to normal, each lower tooth subsequently erupting is forced to take a position mesial to normal in its relation to the upper teeth, and it will be seen that all cases in which the molars are thus locked are easily and naturally grouped in this class, which we have named "Class III."

If this condition exists only in one of the lateral halves of the dental arches it becomes the "subdivision of Class III."

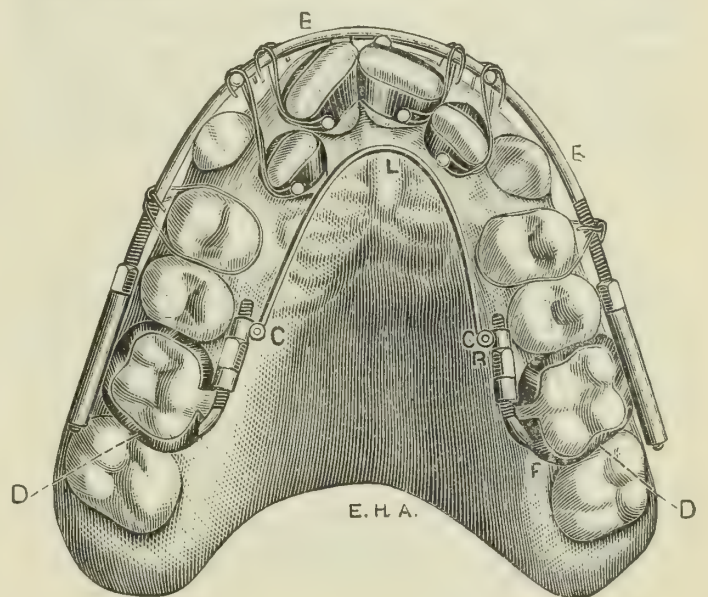
It will thus be seen that the irregular positions of the incisors, canines, and bicuspid in Classes II and III and their subdivisions are only symptoms, or results, of the mislocking of the molars during their eruption.

TREATMENT.

The correct diagnosis of each given case having been made, and the extent of the deviation from the normal positively determined, the treatment becomes clearly indicated. Where the molars are found to be correctly locked, as in Class I, the requirements in adjustment and

it was termed by the early writers "the long band." It is shown as improved and now used by the writer, in position for the correction of the teeth in a badly cramped arch, in Fig. 4. If intelligently

FIG. 4.*



operated it is wonderfully efficient in enlarging the arch in any direction—in the control of teeth moved individually or collectively.

In the treatment of cases belonging

* From Angle's "Treatment of Malocclusion of the Teeth and Fractures of the Maxillæ," 6th edition.

The reader will please omit from consideration the reinforcing lever shown in the vault of the arch.

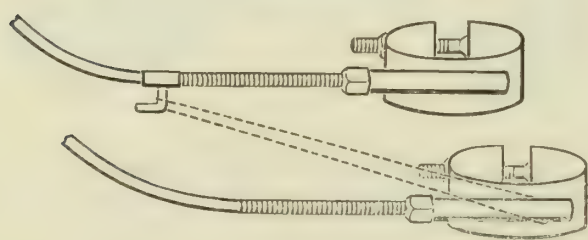
to Classes II and III and their subdivisions, the first molars being locked in malocclusion, we would impress as strongly as we are able the importance of *first* directing our attention to *their* correction—they being the real cause of the deformity and the most important teeth—instead of first directing our energies to the symptoms, as heretofore. For it must be obvious that if we correct only the symptoms we will have the main condition of malocclusion still existing—the jaws still in abnormal relation and the facial lines incorrectly modified, possibly for the worse.

In Class II the teeth of the lower arch being distal to normal in their relations with the upper, the width of one molar cusp, the treatment clearly indicated to correct this condition is not to extract any tooth or teeth, but to shift all of the upper teeth one-half a cusp distally and all the lower teeth one-half a cusp mesially, when we will have established normal locking of the molars, normal relations of all the occlusal planes, harmony in the sizes of the arches and their consequent mutual support; and what is more, the best possible improvement of the facial lines has in all probability been brought about.

THE CORRECTIVE MECHANISM.

To accomplish this the expansion arches and D bands, as shown in the diagram in Fig. 5, and in position in a

FIG. 5.



case belonging to this class shown in Fig. 2, are used. The force is exerted from one or more small rubber ligatures which engage the sheath-hooks shown upon the upper expansion arch and the ends of the sheaths of the D bands on the lower molars. This force is reciprocal, acting directly upon the molars,

the result being to move the lowers mesially and the uppers distally. As the lower first molars are carried forward, the bicuspid and canines are pushed in advance of them, the lower incisors being ligated with wire ligatures to the anterior part of the expansion arch to effect their fine adjustment in the final truing up of the dental arch. The nuts anterior to the sheaths of the bands on the upper first molars are occasionally tightened, as the molars are moved distally, so as to exert all of the force upon them, instead of expending any of it upon the prominent incisors, for the time being.

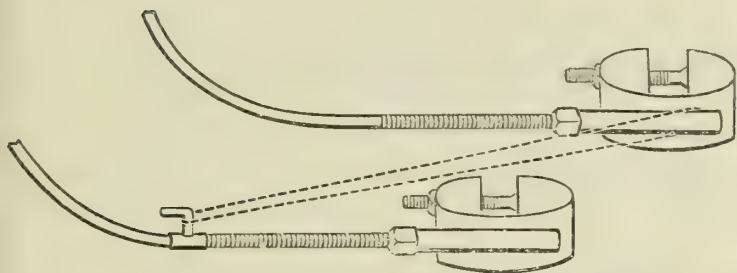
After the upper molars have been moved distally into full normal occlusion it will be found that a space exists between the molars and second bicuspid. The D bands on the upper first molars are then removed, and X bands (like the D bands except that they are smaller) are placed upon the second bicuspid. The nuts on the expansion arch are moved forward and the arch again adjusted, and the force from the rubber ligatures again exerted in order to carry distally the bicuspid. A wire ligature is made to engage the upper first and second bicuspid in order to effect their movement at the same time. As previously in moving the molars, the nuts are kept tight against the sheaths of the X bands in order to exert all the force on the bicuspid and none on the incisors. When these teeth are well back into correct mesio-distal relations with the lower, the nuts are gradually loosened to allow the force to be received by the incisors and canines, which in turn are soon moved into correct relation with their antagonists.

If care and judgment be exercised the operator will be often surprised with the ease and rapidity with which the teeth are adjusted in these pronounced deformities. Of course only those possessing judgment and skill should ever undertake the correction of any case of malocclusion, for, with the careless, embarrassing results will follow this as well as all other delicate operations in dentistry.

CONTROLLING THE RATE OF MOVEMENT.

It is well known to those having had experience that teeth move mesially more readily than distally. This being the case the tendency is for the lower teeth to move more rapidly than the upper. This is easily controlled by lacing the lower incisors to the lower expansion arch with wire ligatures, having first given the arch a downward bend so that

FIG. 6.



when it is lifted up by the ligatures it is made to bind in the sheaths of the bands on the first molars, in this way exerting stationary anchorage upon the molars, or exerting the same strain upon the apex of their roots as upon their crowns, thus enormously increasing their resistance. By taking advantage of this possibility complete control is easily gained in the amount that the teeth of each arch may be moved.

Plain bands are not indicated on any of the incisors unless their rotation is necessary, which should be left until the final truing up of each dental arch, the wire ligatures being all that are necessary.

As the upper molars move distally the tendency of the anterior part of the expansion arch is to move downward toward the cutting edges of the incisors. It is therefore necessary to occasionally loosen the bands on the upper molars (or bicuspids) and adjust them to proper alignment of the sheaths so that the anterior part of the arch will be kept well up toward the gum.

In a case belonging to the subdivision of this class the treatment is identical with that just described except that it is limited to the side of the arches in distal occlusion. Only one sheath-hook

should be used, with its accompanying rubber ligatures.

In a case belonging to Class III the plan of treatment described is reversed, as shown in the diagram, Fig. 6. The sheath-hooks are attached to the lower expansion arch, well forward, and rubber ligatures stretched between them and the sheaths of the D bands on the upper first molars, as shown in Fig. 3.

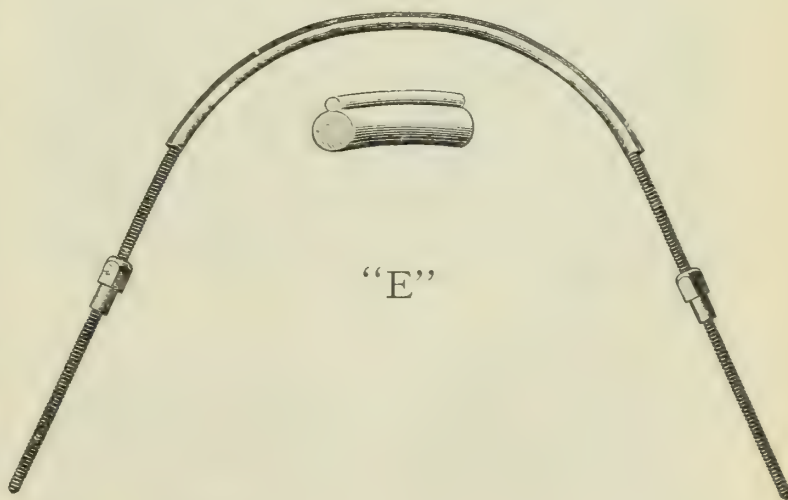
If the subdivision of Class III is to be treated the application of the force on the abnormal side only is necessary.

It will be seen that all cases of all classes may be treated with this appliance, and, we now believe, more quickly, more easily, far better, and with far less inconvenience to the patient than with any other form of appliance. It is the one that seems to be most natural to meet the demands of occlusion, for with it we can have control of the entire dental apparatus—something impossible in the use of the innumerable appliances that have been devised for the correction of symptoms only, without regard for the laws of occlusion. He who will study its possibilities will be more and more impressed with its wonderful efficiency and great simplicity.

IMPROVED EXPANSION ARCH.

My latest improvement to this arch is the delicate rib found upon its labial sur-

FIG. 7.



face, shown in Fig. 7. It is to be notched at desired points to prevent the slipping of the wire ligatures in the deflection mesially or distally of any given tooth.

The advantages of this over the former plan of removing the arch and soft-soldering spurs at the points desired, as in Fig. 4, will be readily appreciated.

Using the reciprocating force from rubber ligatures engaging the opposite arches for the reduction of prominent incisors was an idea given to me by Dr. Henry A. Baker of Boston, but I have recently found that Dr. C. S. Case of Chicago made use of this plan of recip-

rocating force as early as 1893. (See Transactions of the Columbian Dental Congress.) Which of these gentlemen was the first to use it I know not; but be that as it may, I am certain that it is one of the valuable additions to modern orthodontia.

In a subsequent article we will consider more in detail the treatment and retention of cases belonging to these different classes.

THE MANIPULATION AND CARE OF CEMENTS.

By **W. V-B. AMES, D.D.S., Chicago, Ill.**

(Read before the Pennsylvania State Dental Society at Bedford, Pa., July 9, 1902.)

A PHOSPHORIC acid solution, pure and simple, in a proper degree of concentration, will so combine with certain metallic oxids, notably zinc oxid, as to make a workable cement, if proper conditions are observed. While the liquids of cements of this kind in use in dental practice are never simple solutions of phosphoric acid, the same requisites of manipulation hold good to a considerable extent. To be sure, some of the acid solutions largely neutralized with alkaline phosphates need very little consideration in the mix to obtain the best results possible to the combination, but with what I will call the better class of cements, those in which non-alkaline metallic phosphates have been used to modify the working qualities of the acid, certain precautions are necessary, which can be best illustrated by considering a mix of simple syrupy phosphoric acid and basic zinc oxid.

TECHNIQUE OF MIXING.

If basic zinc oxid is mixed with a concentrated solution of phosphoric acid by making small additions of the oxid and spatulating thoroughly, especially the first additions, a workable mass is obtained which will make a quite satisfactory filling. If, however, the zinc oxid is added in larger portions, without

the precaution of spatulating thoroughly the first additions, the mix will set quickly, be granular in packing, and probably generate heat during setting. The difference illustrated here depends simply on the fact that in the gradual mix with much spatulation there is developed a considerable amount of normal phosphate of zinc, from solution of zinc oxid in the acid, which has a modifying influence on the setting process. In cements referred to as the better class, having a liquid consisting of phosphoric acid modified by such metallic phosphates as the zinc phosphate of our illustration, there is a limitation in the process of treating the acid with the phosphates, as the acid solution will not hold, through all the vicissitudes to which it is apt to be subjected, a proportion of these non-alkaline metallic phosphates sufficient for ideal working qualities.

We will suppose or assert that in this class of cements the liquid has been treated with non-alkaline metallic phosphates to the limit of safety, beyond which there would be a probability of crystallization—which is always detrimental if not disastrous. Because of this limitation in the compounding of a high-grade cement, it becomes necessary in their manipulation to adopt to an extent the procedures described in connec-

tion with the plain ortho-phosphoric acid, which will usually give the difference, especially in midsummer, between smooth plasticity with desirable setting qualities and a granular consistence with objectionably quick setting.

My incentive for the making of these points has been from very frequently seeing the ingredients of a mix of cement fairly *slopped* together, there being a semi-mixed borderland at the edge of the supply of powder, giving a clotty condition as it is brought into the mix. If the supply of powder is sufficiently removed from that of the liquid and the additions of powder are carried over in a cleanly manner and then thoroughly spatulated, this clotty condition can be entirely avoided.

PRECAUTIONS AS TO THE LIQUID.

The tendency to crystallization of a properly modified solution of phosphoric acid calls for much care in its handling during consumption. After trying the ordinary cork, the rubber and the glass stopper, also metal screw-cap, I became satisfied that, however the bottle is originally corked, the liquid should never be used from that bottle, but should be transferred to one of proper size having a telescoping glass cap instead of a cork fitting within the neck. The best of the sort obtainable is, I think, the S. S. W. No. 6 office preparation bottle. With the ordinary container, with ordinary handling, there will always be more or less liquid standing about the cork, exposed to the air, which will attract water from the atmosphere during summer months and in winter give up water to the atmosphere of an artificially heated room. In summer the diluted liquid passes into the bottle on each removal of a cork, altering the specific gravity to that extent, and in winter a crystal from about the cork may start crystallization in the main mass of liquid, which would probably have remained free of crystals if

transferred to the other form of bottle, with which this could not happen. The portions of liquid for use may well be removed by means of the *clean* non-corrosive spatula which should be used for the mix. Of non-corrosive spatulas the most practical seems to be that made from a high-grade German silver, the so-called "platinoid" and white metals being apparently of this order. Platino-iridium is probably the very best combination for the purpose, and if socketed into some other metal need not be especially expensive. For a mix of cement in which a slight modification of color is not objectionable a spatula of coin silver or of an alloy of silver and copper containing the proportions giving the maximum rigidity and hardness would be beneficial from a chemical point, supposing that a slight abrasion and chemical action on the metal occur. Phosphates of these metals have a very salutary effect, whereas phosphate of iron, which is necessarily formed to a certain extent when a steel spatula is used, is very detrimental.

The mention of cleanliness in every procedure connected with a mix of cement ought not to be called for, yet since recently seeing a dentist, who has mixed cement long enough to know better, showing at a clinic his so-called new hydraulic and impervious cement and making one mix after another without cleaning his spatula and slab, it seems that a few words on this will not be amiss. The very fact that one crystal of a kind will hasten the formation of other crystals is sufficient reason for beginning a mix of cement with an immaculately clean spatula and slab.

The time I have allotted myself will not admit of any consideration of the real use of the cements. I only wish to refer to the trend in the direction of hydraulic cements for several years, and to predict that this quality, properly developed, will come to be a requisite.

THE "A B C" OF CROWN AND BRIDGE WORK.

By FRED. A. PEESO, D.D.S., Philadelphia, Pa.

(Continued from page 100.)

TREATMENT OF PATHOLOGICAL CONDITIONS OF THE TEETH AND MOUTH IN CONNECTION WITH CROWN AND BRIDGE WORK.

THE treatment of the various disease conditions of the teeth and mouth constitutes a most important element in the successful prosecution of crown and bridge work, and a great deal of time and study should be devoted to it, particularly if dentists make a specialty of this work or do a great deal of it. To cope successfully with the different complications that arise is not so much a question of the number of times that a given case is treated, but of the manner in which the work is done. The dentist must find out the cause of the trouble and remove it, and the treatment, to be effective, must be thorough. We will first consider the treatment of

ACUTE AND CHRONIC ALVEOLAR ABSCESS.

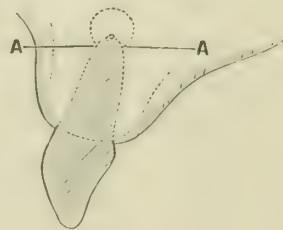
Of all the different diseases of the oral cavity with which the crown and bridge specialist has to contend, alveolar abscess is probably the one which he most frequently encounters and is called upon to treat. It is also one of the most easily cured, providing he goes about it in the right manner. Of course there are exceptions, but they are very few, and in these exceptional cases there are generally other complications which retard or altogether prevent a cure. An abscessed tooth, if properly treated, will form practically as good and as permanent an abutment for the support of a crown or a bridge as one which has been freshly devitalized and filled.

In dealing with this trouble, it is not

necessary to have the patient coming to the office for treatment every day, or two or three times a week, for weeks or months. It is very seldom that an abscess, either acute or chronic, cannot be permanently cured by one or at most two treatments; but to do this, as said before, the operator must do his work thoroughly and the roots should be filled immediately after the final treatment. Just as long as the roots remain open, just so long will the abscess be active. Septic gases will form in the canals, which will keep up the irritation and inflammation, and pus will be present.

A dentist should never undertake to treat a blind abscess without having first made a fistula through which the abscess can be reached and drained. The apex of the root always projects for a distance into the necrotic area formed by the abscess, and it cannot be expected that the remedies which are injected through the small apical foramen into this space will cleanse it and carry the débris back through the same opening. (Fig. 31.)

FIG. 31.



Even if it were possible to carry a sufficient amount of medicaments into the pocket to be effective under favorable conditions, still there would be a certain amount of the débris which would lodge in the pocket around the projecting apex as at point A, Fig. 31, which would act

as a foreign body and irritant and would eventually bring about a recurrence of the disturbance. If the abscess is discharging through the canal and there is no particular cause to hurry, the root may be sealed with gutta-percha and an effort made to force a fistula. The operator will assist matters by painting the gum with iodine, or using capsicum plasters, or other applications generally used to force an abscess. If the pain be too great for the patient to endure, it is well to assist nature by resorting to heroic measures and drilling through the process. A patient naturally dreads a first operation of this kind, but it can be done with really very little pain.

OPERATIVE TECHNIQUE FOR THE TREATMENT OF CHRONIC ABSCESS.

As a first step, the root should be opened, the canal thoroughly cleansed, and the apical foramen somewhat enlarged. For this purpose the Gates-Glidden drills, Donaldson's canal cleansers, the Kerr broaches, or the Fellowship broaches are best adapted—the latter especially where the canals are very constricted and have to be enlarged, as they are very strong and there is less liability of their being broken off in the roots. These can be used first and followed with the Gates-Glidden drills. If the root is to be used for a crown or as an abutment for a bridge where a pin is to be inserted in the canal, the Gates-Glidden drills can be followed by a root-reamer and the canal enlarged to the desired size and depth at once.

It is now necessary to find the exact length of the root, so as to know just how far above the gum line to make the opening. This can be done with a very small broach, the end of which is bent at a right angle so as to form a hook. First take a small piece of rubber dam and force the broach through it well up toward the handle. (Fig. 32.)

The broach is now introduced into the canal and the end passed through the apical foramen so that the hook will pass over and catch on the edge of the apex of

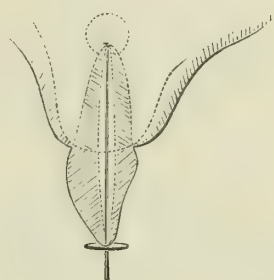
the root. The piece of rubber dam is pushed along the instrument to the incisive edge of the tooth or to the exposed end of the root. (Fig. 33.) It is now

FIG. 32.



removed and we have the exact distance from the end of the tooth or root to the apex. To determine the exact position of the apex, another broach, large enough to wedge and remain fixed, is introduced into the canal and the end passed

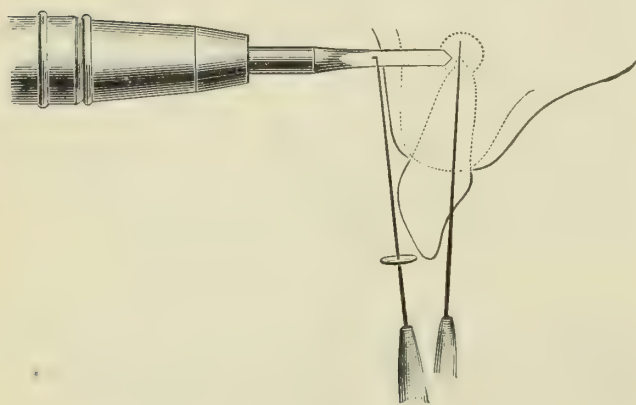
FIG. 33.



through the apical foramen into the pocket and allowed to remain until after the opening has been made. Now, by placing the hooked broach over the tooth and gum, the rubber coming to the incisive edge of the tooth or to the exposed surface of the root, and taking note of the direction of the broach which remains fixed in the canal, the exact location of the apex is determined. (Fig. 34.) There are different ways of opening through

the gum to the process. It may be done by lancing; with carbolic acid; by using a small trephine, or by drilling through the gum and process at once. When the

FIG. 34.



second method named is employed, a small roll of absorbent cotton or bibulous paper should be placed near and below the proposed opening, to prevent the acid from spreading on the gum. A little carbolic acid is poured into a watch-glass or other suitable vessel and placed on the bracket table within easy reach. A fair-sized spoon excavator, very sharp and thoroughly clean, is then dipped into the acid, and the gum, at the point immediately over the apex of the root, is gradually scraped away as it becomes cauterized by the carbolic acid. Whenever there is a sign of bleeding, the instrument is again dipped in the acid and the operation repeated until the bony process is reached. This is an almost painless and bloodless operation and can be done in a very few minutes.

When the lancet, trephine, or drill is used, if the gum is very sensitive a local anesthetic can be injected. Some patients suffer almost as much from the use of the hypodermic syringe as they would from the operation itself, but the pain occasioned by the introduction of the needle may be almost entirely overcome by a little care on the part of the operator. He should first make sure that his syringe is in good order and does not leak, and that the point of the needle is sharp and clean. After filling the

syringe he should press the tapered side of the point tightly against the gum, at the same time pushing on the plunger. The instrument should be held in this position for a moment, and then the needle should be forced very slowly into the gum, at the same time that the pressure is being kept up on the plunger. In this way the tissues are kept anesthetized ahead of the needle, and there is very little or no pain to the patient.

OPENING THE ALVEOLAR PLATE.

In opening through the process, a spear-pointed drill of about one-sixteenth of an inch in diameter is probably the best instrument for the purpose. Of course it is understood that in all operations of this character there must be absolute cleanliness and the instruments used must be thoroughly sterilized, so that there will be no danger of infection. This should be effected by boiling, and during the operation they should be frequently washed in a solution of carbolic acid, formalin, or some other powerful antiseptic. This should be done as often as the instruments are used, and they should be kept in the solution until they are needed.

Everything being in readiness, with the engine running rapidly the point of the drill is placed just over the apex of the root and driven through the process and into the pocket so as to strike the end of the broach which extends through the apical foramen. (Fig. 34.) As soon as the broach is touched there is a positive certainty that the proper point has been reached and that there is a free opening through the root to the surface of the gum through which remedies can be forced.

If the abscess be of long standing, there will almost certainly be some necrosis of the process and of the apex of the root, which in some cases may have extended so as to involve the jaw-bone proper. This diseased tissue must be removed, which can generally be best accomplished with very coarse and large

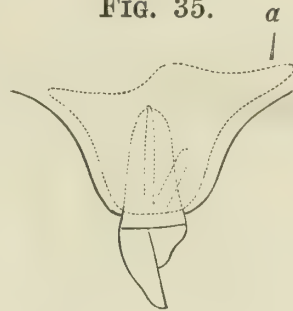
rose burs. It is always best to amputate the end of the root. The pocket should be thoroughly cleaned out and every particle of necrosed bone should be cut away. A large and sharp spoon excavator can also be used to advantage in these operations. It can readily be determined by the touch of the instrument when all of the diseased bone has been cut away. When cutting necrosed bone there is a coarse, honeycomb-like feeling under the instrument, but as soon as it is all cut away, the healthy bone will feel smooth in comparison. When there is an extended area of necrosis it may be necessary to lance the gum in order to reach it.

AN ILLUSTRATIVE CASE.

An interesting case of alveolar abscess accompanied by extended necrosis came under observation a few years ago. The patient was a man of about thirty-five or forty years of age. A couple of years previous, two crowns had been placed on the upper central roots. He had suffered greatly at the time of having the roots prepared, and also when the crowns were put on and for some time afterward. Shortly after they were inserted an abscess appeared in the palate on the median line, about half an inch back of the teeth. This continued to get worse, and when the writer first saw him the pus was also exuding from around the necks of the teeth on the palatal side. The roots were very loose, so that great care had to be exercised in removing the crowns. When this was done, a sorry condition of affairs was discovered. Neither of the roots had been opened up on a line with the canals, but both were perforated a short distance below the gum line on the palatal side, the dentist having drilled through the side of the root and into the process, and the crowns had been cemented in that way with the pins protruding through the root and about three-sixteenths of an inch into the process, as shown in Fig. 35. Of course the roots had to be removed, and both of them were found to be open on the palatal side for about one-half their

entire length. (Fig. 36.) The process was entirely gone from the palatal side of the two central roots, and the necrosed area extended on each side, so as to par-

FIG. 35.



tially denude the roots of the two laterals, and back into the palate to a point at about *a* in Fig. 35, where the palatal process was perforated so that a large instrument could be passed through the opening, lifting the mucous membrane covering the floor of the nasal fossa. Here it was necessary to cut the gum on the palatal side nearly to the point of perforation, draw it away on each side, and with burs and large spoon

FIG. 36.



excavators made for that purpose cut and scrape until all of the diseased bone was removed.

In another case of a year ago, the patient was a lady of about thirty. A Logan crown had been placed on the upper right first bicuspid. Every dentist should know that this tooth has two roots, but instead of opening up the canals the dentist had drilled directly through the floor of the pulp-chamber and into the process between the two roots, and the crown was adjusted and cemented in that way. Naturally the patient suffered a great deal during the operation and when the crown was ce-

mented, but she was told that it was all right and that the trouble would soon pass away. The patient went abroad immediately after the work was done, but instead of getting better the trouble grew worse until she could bear it no longer, and she had the crown removed by a German dentist, who treated it and filled the pulp-chamber with gutta-percha, but evidently without discovering that anything was wrong. She still continued to suffer, and when she returned to this country, on removing the filling of gutta-percha the root was found to be in the condition already described. Gutta-percha and cement had been forced into the cavity in the process between the roots, and both roots were badly abscessed. Both of the canals were easily found and opened to the apex. It was necessary to amputate the ends of both roots, and after treatment the canals were filled and the root utilized as an abutment for a bridge, which is doing good service at the present time. Such conditions are frequently encountered, and it is often very troublesome, or altogether impossible, to correct them.

The tooth and surrounding parts having received the necessary surgical treatment, the condition is now ready for the medicinal application. The No. 33 abscess syringe, with a rubber bulb of one-quarter ounce capacity, and a hard rubber and a rubber-and-platinum point, is most suitable for this work.

MEDICINAL TREATMENT.

There are many remedies which are used in the treatment of alveolar abscess, but positive and immediate results can be obtained by using three per cent. hydrogen dioxid and aromatic sulfuric acid. The point of the syringe should be wrapped with rubber or gutta-percha so as to completely close the opening in the tooth or root and enable the drugs to be forced through the fistula. A good way to do this is to take a piece of thick, square separating rubber, punch a small hole through it and push the point of the syringe through, letting

it extend a little beyond the rubber. (Fig. 37.) The point of the syringe can then be introduced into the canal and the rubber pressed firmly against

FIG. 37.



the tooth with a pair of pliers, closing the opening perfectly, so that none of the liquid can escape at the point of entrance, but it will go where it is wanted.

The hydrogen dioxid is first used, and is forced slowly into the root and out through the fistula. This should be kept up as long as there is any sign of pus or any effervescence of the solution. There is no danger of using too much, and two or three ounces or even more can be used with safety. The use of this drug is objected to by some, on the ground that it is liable to bring about a necrotic condition, but this is probably a mistake. If there were no vent through which the solution could escape and it were forced into the cavity under great pressure, or if the end of the root became closed so as to allow no escape for the gas which forms, trouble might ensue, but there is no danger of ill results following its use if there is a free opening.

As soon as the frothing ceases it should be followed by the aromatic sulfuric acid, full strength, which contains about ten per cent. by bulk or twenty per cent. by weight of sulfuric acid, used in the same manner as the H_2O_2 . It should be forced very slowly through the opening, and at the same time the mouth should be flooded with a strong solution of bicarbonate of soda, using it very

freely. This can be easily done with another syringe held in the left hand and holding the point of the syringe just above the fistula, so that the soda solution will meet the acid as it leaves the fistula. The patient should also rinse the mouth well with the soda after the treatment. Do not be afraid to use the acid freely. From one-sixteenth to one-eighth or one-quarter of an ounce may be used with safety. This will burn away any diseased bone or tissue remaining and the irritation will be conducive to new and healthy granulation. The root should be filled immediately after the final treatment. If the tooth is to have a crown where a pin is to be used, only the apex need be filled.

Where the apex of the root has been amputated and the foramen has been enlarged, great care must be observed in filling, as there is danger of forcing a quantity of the filling material through the foramen and into the pocket. This root-filling when it has been carried through the end of the root is often the cause of an abscess, or of failure to effect a cure, it being a foreign body and causing irritation and inflammation.

FILLING OF THE ROOT.

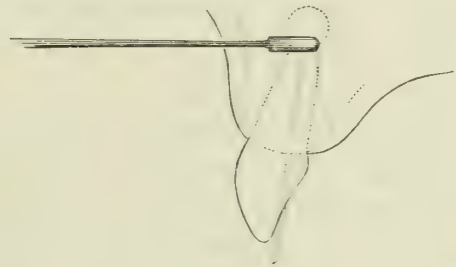
Where an opening has been made through the process, the following will be the safest course to pursue in filling the root: The filling material should be made ready and fixed so that it can be quickly introduced. A broach with some cotton twisted around it for wiping out the canal and some cotton or bibulous paper points for drying, together with some alcohol, should be close at hand. A large spoon excavator or some instrument flat at the end is passed through the opening over the root, held with the left hand and pressed tightly against the end of the root. The canal should then be wiped out with alcohol, using the cotton on the broach for this purpose, and then thoroughly dried with the absorbent

points and hot air. The filling can now be packed tightly against the instrument held over the apex, and there will be no danger of its being forced into the apical space. (Fig. 38.) A thick gutta-percha point makes a good filling for cases of this kind, and it has the advantage of being easily manipulated. Copper amalgam forms one of the best filling materials for this purpose and for perforations.

Where it is not possible to hold an instrument over the end of the root, a plugger is selected that is large enough, so that it will enter the canal only to within about one-sixteenth of an inch, or a little more than that, from the apex. The amount of material necessary to fill this space should be gauged as accurately as possible and packed firmly in place.

Where there has been much necrosis, leaving a large pocket after the diseased tissue has been removed, it is well to pack the cavity lightly with antiseptic gauze, or to use a seton of floss silk or some suitable material, to keep the cavity

FIG. 38.



drained and to wash it out occasionally with glyco-thymolin until granulation is well advanced.

There are other methods of treating alveolar abscess, and many of them will effect a cure, but for immediate and sure results the one described above can be depended upon. The operator is at liberty to choose from the many. None of them will be effective unless the work is done thoroughly in every part.

(To be continued.)

RECURRENT CARIES.

By EARL C. RICE, D.D.S., Philadelphia, Pa.

(Read before the Pennsylvania State Dental Society, at Bedford, Pa., July 9, 1902.)

IT is with a degree of hesitation that I present the subject of "recurrent caries" to this society, as it has been handled so thoroughly in the past by other members of the dental profession. It has been said by philosophers of old that a subject examined many times will at each examination reveal some new or altered thought. It is with the hope that this paper, together with the discussion that will follow, may bring out some thought worthy of the valuable time expended that I proceed to the subject.

Granted that the theory of dental caries as advanced by Dr. Miller of Berlin is correct, let us consider the mechanical principles involved in the treatment of carious cavities, and the ill effects of their misapplication.

It is a noted fact that caries recurs more frequently at the margins with certain filling materials than with others, which is no doubt largely due to therapeutic properties possessed by the substances used. This point is most beautifully demonstrated in the use of pink base-plate gutta-percha, which under the most adverse circumstances preserves tooth tissue and combats carious influences. As pointed out by Dr. Litch, the action of heat upon the vermilion used in the coloring of the gutta-percha causes an oxid of mercury, or possibly metallic mercury, to be set free, which, when brought in contact with the fluids of the mouth, is converted into a mercury salt which has antiseptic properties.

Gold, tin, and amalgam also have therapeutic qualities which have not been satisfactorily explained.

Correct cavity preparation is the keynote of success. Too often are cavities only partly excavated and decalcified dentin is allowed to remain between the filling and the pulp with the hope that it

will recalcify. I would say, "Hope on, earnest advocate of this method!—you will some day awaken from your blissful dream and place in alcohol the pulps which you have destroyed, as monuments to your failure."

The theory of extension for prevention is an admirable one, but one that has been greatly abused. I do not think the author of the method ever intended that *all* cervical margins should be extended beneath the gum margin—that lingual and buccal margins should be extended to so extravagant a degree except in special cases.

The predisposition of a tooth to extended caries should be very carefully studied, and if the surface is well formed—and great stress should be laid upon this point—the margin may be made anywhere or at any line where the enamel is normal, except at the area of contact.

In dressing the enamel at the margins of cavities it is necessary that the direction of the so-called enamel rods be carefully noted, and the margin so fashioned that those rods which mark the external periphery of the filling extend unbroken through to the underlying dentin. Failure to accomplish this results in untold disaster, characterized by V-shaped spaces at the margins of fillings which form excellent pockets for the retention of food débris.

Many of the better alloys are not given a sufficiently high position in the ranks of filling materials. Sad to relate, many of our brother practitioners who are pioneers of the dental art give alloy the cold shoulder. How often do we see alloy fillings highly polished? Very seldom. Let me say right here that until the practice becomes general to finish and polish alloy fillings with the same great care that we observe with gold, we need not expect very gratifying

results, nor will it be fair to attempt to establish any data with regard to its properties as a tooth-preserver.

The only safe method of isolating a tooth for filling is with rubber dam. Unfortunately, I have not reached that sublime state of proficiency whereby I can apply it in all cases. However, where it is possible, the dam should always be used. Cavities examined in an absolutely dry state only can be pronounced ready for a filling. The powdered dentin, reduced to this condition by the bur, when slightly moistened clings to the cavity walls, and when the cavity is dried it appears like the wall itself. A filling inserted over a thin layer of this fine dentin, though it may be aseptic, will sooner or later fail. The substance, being thoroughly dry, has an affinity for moisture which it will in all probability obtain from the fluids of the mouth, with the inevitable result—marginal decay.

The improper use of the rubber dam is apt to make it as much a menace to successful work as it has been a boon.

Teeth that have been isolated for a long period become desiccated as pointed out by their change in shade. The natural moisture has been driven off by evaporation. The moisture should be again supplied to the isolated teeth in the form of some thin watery or alcoholic alkaline solution applied for some minutes before the dam is removed. This thought may produce a typical quiet, up-the-coatsleeve smile; even so, try it, and you may find the margins of your fillings will not become dark as they have done possibly once or twice during your practice in the past.

I thank you, one and all, for the courtesy you have extended in permitting my paper to be presented, and I trust that you will proceed to correct the errors and insert the omissions.

PRINCIPLES FOR CAVITY PREPARATION.

By J. M. MEYER, D.D.S., Tacoma, Wash.

(Read at the annual meeting of the Washington State Dental Society, at Tacoma, Wash., May 23, 1902.)

MR. PRESIDENT, LADIES AND GENTLEMEN: I have not prepared a paper upon this subject, but intend to talk from the standpoint of principle, and not ideal cavity preparation. Ordinarily the text-book divides this subject into three classes: (1) Opening of the cavity; (2) Removal of decay; (3) Shaping the cavity. The idea from the standpoint of principle is that throughout the subject in the text-book we find principles for cavity preparation dropping in here and there—disconnected, as it were—and from a standpoint of study, particularly for the dental student, the scheme is without classification.

I have this apology to offer: The classification of these principles is rather an elementary subject to present to mature operators, as it is really a subject

for dental students, and you will see from what is said that this subject will not be of the same interest to the practitioner that it would be to the beginner.

Each principle in itself might constitute the subject for a chapter, and the discussion in detail would prove that there is still some "meat on the bone."

We have seen fit to divide this subject under the head of five general classes:

Class I: Exposure.

Class II: Removal of foreign matter and necrotic dentin.

Class III: Shaping of the cavity related with the dentin,—known as the cavity proper.

Class IV: Shaping of the cavity related with the enamel,—known as cavity margins.

Class V: Supplemental considerations.

Under each class we will arrange the principles involved in that particular stage of the operation.

CLASS I.

Principle A. All cavities are to have such exposure as will admit of access to all parts for preparation and the introduction of the filling material.

Principle B. Where fissures exist, these are to be included in the exposure of principle A, throughout their extent.

Principle C. Any imperfection of the enamel associated with the orifice of the cavity is to be included in the exposure; in other words, the exposure is to be extended to strong and perfect enamel boundaries.

Principle D. Where margins of the cavity approach developmental grooves, such grooves are to be included in the exposure.

Principle E. Where margins of the cavity approach the gingival boundary, the exposure is to extend beyond such line.

Principle F. Cleavage lines of the enamel are to be considered in making the exposure.

CLASS II.

Principle A. Foreign matter is to be removed with tepid water thrown from a syringe.

Principle B. Apply rubber dam, or employ other means to exclude moisture; dry cavity with absorbents and warm air.

Principle C. Remove necrotic dentin by cutting in a direction from the pulp toward the enamel; all devitalized or softened dentin should be removed. The exception to this principle will be that portion of dentin immediately overlying the pulp organ.

CLASS III.

Principle A. That portion of the cavity related with the dentin should be as nearly a retaining shape throughout as the case will admit.

Principle B. The cavity proper is to

have a flat base, with walls at right or acute angles wherever admissible.

Principle C. Undercuts are to be so placed as not to weaken the walls; pits or grooves are to be made in the dentin, not between dentin and enamel.

Principle D. Where fillings are exposed to the pressure of mastication, special attention is to be given to stress. Flat surfaces at right angles to the direction of such force, and of equal area to the exposure, should be employed.

CLASS IV.

Principle A. Enamel margins are to be supported by underlying dentin.

Principle B. Margins are to be strong (not feather-edge) and beveled to an obtuse angle with surrounding surfaces.

Principle C. All angles of the orifice are to be well rounded.

Principle D. Margins are not to relate with approximating teeth.

CLASS V.

Principle A. Proximity of the pulp is to be considered at all stages of the operation.

Principle B. Sensitive dentin is to be treated as indicated.

Principle C. Thermal extremes to exposed cavities are to be avoided.

Principle D. All cavities are to be sterilized before filling material is introduced.

To suggest that principles will not prepare cavities for filling teeth will call forth no opposition. An old operator, once asked what in his opinion was the best filling material, said, "In all my experience as a teacher and practitioner, the best material I have yet found is 'common sense.'" Principles alone will not produce the requirements; no more will "common sense,"—but principles first, well mixed with practical experience, with a liberal seasoning of common sense, will produce results in dentistry as the principles of surgery have served suffering humanity in the hands of the general surgeon.

DIET IN RIGGS' DISEASE (PYORRHEA ALVEOLARIS).

By J. WARREN ACHORN, M.D., Boston, Mass.

(Read before the Northeastern Dental Association at its annual meeting, October 16, 1902.)

IF water were the only food required, other things being equal, everyone's health should be equal to every other one's. But things never are equal, and so there is a decided difference between water and its effects and what this or that one eats or drinks; something makes this one fat and that one lean, this one plethoric and that one anemic, this one rheumatic and that one lithemic or asthmatic. Inheritances, habits, work, surroundings, temperament, play, food, and drink, all have to be considered in the sum of the things that finally get a well man out of order. If the stool of health requires three legs before one can sit on it safely, and one of these legs is found to be lame at some time, will you not agree with me that, in a chance lot of cases, it is more often found to be due to something eaten than to anything else?

Most of us go on eating and drinking and doing things we learned to do unconsciously as children or acquired in some other thoughtless way without regard to the after-effects, never once seriously asking ourselves whether as individuals this is the right thing for us, until some fine morning disease drives us to consult a *doctor*, and we find we are in for it, with no better reason or excuse than this, that we have taken too much for granted.

THE PERSONAL EQUATION IN EATING.

Many people eat seven things right and in the right way, but Heaven only knows what they will do when it comes to that eighth thing, that something they like in particular, that has six inches of "taste good" in it for them and twenty-three feet of stomach-ache afterward for solution. It may be this eighth thing alone that plays havoc with their digestion and metabolism. Controlling the indiscriminate use of some one food or

class of foods will work wonders occasionally. One person may eat a thing objectionable for the average individual, and never hear from it, because for him there is nothing indigestible about it; his neighbor, looking on, thinks he can do the same, not appreciating the individual factor in the equation, and so it goes until they are all at it. It is all summed up in the expression, "Oh, that won't hurt you."

There was probably a time when a man could eat anything in sight, simply because he lived, like any other animal or vegetable, in the open air and did not have much to choose from; his diet was sustaining, but a simple one. Now he is fenced in by stone buildings, he walks on stone streets, and looks out upon the world through a hole in the wall. Is it any wonder, in view of all the changes to which he has been subjected, in view of the innumerable things he is doing in a hurry, and the foods he is eating in a hurry, brought from all parts of the world and cooked in all sorts of ways, that his digestion fails, that he gets out of tune or out of proportion and finds himself troubled with some chronic ailment, the result of misfit food, waste in his system or something worse? What one can eat with impunity at twenty is not necessarily the food that fits best at forty; with each decade the food that one eats would better be modified to satisfy special indications or changes incident to age and occupation. Would it not be a wise precaution for everyone to consult his physician once a year, at least, and let him say what, if anything, is wrong with the machine, the way it is run, or the food it is given. We all go to our tailor, our hatter, our shoeman, and may I not say to our dentist (for I have an idea that people go more readily to the dentist than to the doctor) with fair regularity, and why not to the

chief engineer of the body for inspection and a certificate good for six months or a year? Preventive medicine is the only true way to practice the art, but the world, as you know, the Western world, does not think so. Here we work at our professions, dentists and physicians alike, with the cart before the horse.

THE PHYSIOLOGICAL BALANCE.

If a man's lung capacity is what it should be compared with his weight, and his lung capacity is not below the standard for his height, if his blood and urine are right under the microscope, and all his eliminative organs are acting normally, if his food and drink are sufficient to maintain his health and strength against his work and habits, if he is physically sound and at peace with himself, he is as near perfect as he can ever hope to be in this world. My definition for all this is "physiological balance," something every person should strive to keep if they have it, or to attain by right life and living if they haven't it.

A man five feet eight inches in height, and twenty-two years old, should have a lung capacity of two hundred and thirty to two hundred and forty cubic inches, and weigh one hundred and fifty-five pounds. For a woman five feet three inches in height, nineteen years old, the lung capacity should be one hundred and fifty cubic inches, and weight one hundred and thirty pounds. I simply give these measurements that you may realize even while I am speaking how far the average individual is from the ideal standard.

Chronic disorders, such as rheumatism, lithemia (American gout), real gout, dyspeptic asthma, certain kinds of headache, gastric hyperacidity, biliousness, and acne, are recognized by physicians generally as due in part, and in some instances entirely, to disorders of digestion the result of misfit foods or failure of elimination from whatever cause.

NUTRITION AND RIGGS' DISEASE.

It was while engaged in rectifying ills of this sort by dietetic treatment

and other associated means when indicated that I incidentally treated pyorrhea alveolaris and succeeded in relieving some cases and curing others. I did this unconsciously in the beginning, Riggs' disease being a local disorder to my mind at that time.

Sometimes the case was one of obesity complicated by rheumatism; sometimes one of hyperacidity associated with headaches or constipation; sometimes lithemia or biliousness was the fundamental symptom, and sometimes there was no diathesis, the patient was out of tune mentally and had lost his balance physically from overwork or worry, or was handicapped by a small pair of lungs, or by a weak heart and small digestive organs, that in turn affected his elimination or nutrition: in a word, the machinery was not adequate to the mill in which it was set up; and here is where this idea of *balance* finds its greatest application.

If the case under consideration was one of the uric acid variety, as the majority of them were, I restricted the use of acids for a time, whether that found in meat, fish, vegetables, or condiments. When this diathesis was not present either in the family history or in the patient, I dieted according to the indications, always with a view to securing relief by gaining the coveted physiological balance, a normal physical and mental condition such as I have already defined.

PREDISPOSING AND SUBSTITUTE FOODS.

I am satisfied that meat and sugar in excess aggravate the group of disorders under discussion, including Riggs' disease. How much this disease is conditioned upon the local action of these and other foods I am unable to say. Curiously enough, the uric acid in meats and the uric acid in nuts, even though they be identical, do not act in the same way when taken into the system. I have seen aches and pains follow the use of meat, and this was not the case when nuts were ingested.

The uric acid foods are the red meats,—steak, roast beef, etc., and all viscera,

such as liver, sweetbreads, and kidneys. Among the liquids may be mentioned tea, coffee, cocoa, beers, and soup made from meat stock.

Mutton, lamb, and veal are among the least objectionable of the red meats. The red meats that seem to be an exception to the rest are venison and rabbit. Wild animals, being much more active and having purer food and water to eat and drink than the stall-fed animals of commerce, are freer, I imagine, from waste products—from their own rheumatism, if you please. At any rate, these meats do not act as injuriously as those that are stall-fed.

The substitutes for red meat are the white meat of chicken, turkey, capon, fresh fish (that is, they contain less uric acid), eggs, oatmeal, gluten, macaroni, peas, beans, nuts, milk, and cheese. I mention peas, beans, and nuts here, because they do not produce in my experience the same effect upon the system that the commercial red meats do. With some, red meat may be eaten once a day aside from fish. White meat and fish I rate about the same, except that white meat is the better digested. If there are "symptoms," vague aches that persist, I generally stop meats altogether, unless sufficient water is being taken to keep the system free.

The substitute drinks for tea, cocoa, coffee, etc., are the cereal coffees, water, milk, buttermilk, and white wines in moderation.

The uric acid vegetables are peas, beans, and here I will mention nuts. Then there are those that contain oxalate of lime, which is akin to uric acid in its action on the system, asparagus, spinach, cabbage, rhubarb, tomatoes, carrots, string beans, celery, and radishes. Vegetables containing these acids should have a restricted use as may be determined by the condition of the patient and in part by examinations of the urine.

The best sugars are pure maple syrup in season, pure honey for those who can eat it, sugar of milk, and saccharin. When maple syrup cannot be obtained, syrup made from the maple loaf is preferable to the granulated sugar. This

choice is due to the difference in local effect, the maple syrup in my experience being less irritating to the stomach. Maltose and other western products of the kind are useful, but a taste for them has to be acquired. With the sorghum of the sugar cane I have had no professional experience. Sugar in measured quantities is a desirable food for children with their activities and rapid digestion to be satisfied, coupled with the demand for a food that will afford quick energy and make ready fat; but for grown people its use in excess is unhealthful, a source of intestinal fermentation and of irritation throughout the system. Its free use and that of red meat in the class of disorders enumerated is certainly bad.

Fruits have a limited use much the same as have vegetables. The innocent-looking cultivated strawberry is by no means innocent. It is usually in a state of mild decay when eaten, but this is smothered under sugar and cream. Even wholesome strawberries of the cultivated sort work mischief; there is something in them that causes aches and pains pointing to systemic disturbance. Sweet grapes and uncooked pears eaten freely induce lassitude, nausea, and consequent loss of appetite. All fruits would be better cooked and eaten without sugar, or only a dash of it. The safest fruits are apples, raw or cooked, baked pears, white grapes, oranges, cantaloups, plums, and peaches. Bananas baked in their jackets are rendered quite digestible. I may add here that the free use of vinegar, pickles, and condiments is unwise.

For the rest, most fine-fibered fish are allowable, if fresh, such as cod, haddock, flounder, the lean of shad and bluefish, raw oysters, and plain lobster; perch, bass, or other lake or brook fish, baked or broiled, but never fried. Fried food is an abomination. The frying-pan landed here in 1492 and from that day until recent times it has ruled over every stomach and kitchen in the land. The people in New England are still in love with it, and in the southern states, where the standard of cooking is measured by the darkey mind, it rules su-

preme. I am honestly of the opinion that fried food has caused as much misery, first and last, as alcohol.

Eggs are often eaten in too great quantity. On account of the fat and iron contained in the yolks, they produce the condition known as biliousness. They are better eaten on alternate days of the week, soft-boiled or poached.

The use of breads and cereals depends upon whether the patient can digest them readily, is in need of carbohydrates, or should be denied them. That starches aggravate the diseases under consideration, by inducing intestinal fermentation when not properly cooked, or when eaten in too great a quantity, is true. The starch of loaf bread, potatoes, beans, and sweet potatoes is seldom thoroughly cooked and is therefore open to suspicion. White bread as ordinarily toasted is made worse by the operation; if toasted and redried, the starch is converted. Rye, Graham, and stale white bread are the best of the home-made kinds. Rusk, zwieback, the crust of French bread, Pilot bread, and Cestus phosphated crackers, can all be used to advantage at times. Beans baked in the ground are all right. Cereals as now prepared for the market are a wholesome class of foods. Butter is the best fat, and next to that olive oil or cream. Bacon fat is also useful eaten with dry toast. The amount of fat, and the kind, depend upon the needs of the patient and his ability to digest it. Fats are not acted on in the stomach. Desserts are a snare: an inducement for those who have eaten enough to eat more only to do them harm. If a patient has a poor appetite that needs tempting they are permissible, but an equally good way to nourish is by a fourth meal at bedtime,—strained oatmeal gruel, hot milk with Vigor chocolate, an egg in milk or swallowed whole in Moxie.

THE USE OF WATER.

The unintelligent use or the lack of use of water is often a cause of chronic ailments, due to disorders of digestion.

The best time to drink liquids is an hour before breakfast, between meals, and on retiring. Not more than one or two glasses should be taken at mealtimes, and no other liquid should be drunk if soup be indulged in. I may say of soups that in small amount they are not objectionable. In the diseases under consideration soups made from meat stock are contraindicated; they are simply so much urea. Milk and meat do not go well together, or milk as a beverage with vegetables. Milk goes with eggs, fish, fruit, or cereals. It were better sipped during the meal. Tea and meat do not go together; the tannin in the tea hardens the meat fiber. Cereal coffees, water, or wine go with meats. Some people wash their food down with whatever they may be drinking. No liquid should be drunk until after the food in the mouth is swallowed.

The constitutional treatment of Riggs' disease, from a dietetic point of view, is not essentially different from that of other disorders due to food not suited to the individual, to diatheses, inheritances, and bad habits. I only insist in addition upon the physiological balance when lost, or there is an approach to losing it, for I am satisfied that there may be cases of pyorrhea alveolaris, as there are other unhealthy physical states without a name, that are due to want of balance and that alone. You all know better than I the percentage of cases that are of purely local origin, and the immediate causes for it; probably the larger proportion of all cases would be in this class. I only hope, if you have intractable cases, whether or not under the bane of some diathesis, you will resort, to help you out, to dietetic and hygienic treatment such as the indications suggest. Riggs' disease as I see it is a wholesale problem in certain cases, and the cure depends upon nothing being overlooked that tends to aggravate the trouble and upon everything being done that will raise or lower that individual until he is at par with himself and his surroundings.

CEMENTS.

By **BURTON E. LEMLEY, D.D.S., Tacoma, Wash.**

(Read before the Washington State Dental Society, Tacoma, May 24, 1902.)

IN presenting this paper no apologies will be made for not having attained higher scientific results. This being a first attempt at any such work, with no precedent by which to be guided, the crudeness of the attempt has been recognized only as the tests progressed.

By inquiry among members of the profession the fact was brought out that scarcely any two dentists used the same cement,—each claiming that he used the best. Further inquiry elicited but few real reasons why one cement excelled another, except that such and such manufacturers and agents said their particular brand was the best, or that it was generally conceded to be such. On this account an attempt has been made to establish facts by making working tests along individual lines. Some assistance was obtained from an article in an old copy of the *Cosmos*, but the work outlined there, while showing a high grade of scientific work, did not meet the demands of the case from the standpoints of penetrability, solubility, and wear. The first fact to be established was to find which cements offered the most resistance to the conditions in which they were placed for use, a premise having been taken that if fluids would penetrate the substance of a cement, that cement would disintegrate before one that was impervious to the same fluids.

CHARACTER OF THE TESTS.

The methods of preparing the samples and tests must be kept in mind while drawing conclusions. Twenty different kinds of cement were obtained and were mixed according to directions accompanying them as far as possible. The samples stood twenty-four hours before they were immersed in the solutions. The solution used for testing penetration was of red anilin; that for solvency was a strong solution of ammonia. These

samples were kept in the anilin about ten days; in the ammonia about twenty. The crushing test consisted of a long lever shod with metal plates, between which the samples were placed, shot being poured into a pail at the end of the lever until the sample was crushed. The amount of shot was then weighed. The figures denote nothing except comparison. The amount of weight required ranged from 0 to 8 lbs. I do not deem this test of much value, as the amount of pressure required to crush a sample is so much greater than could possibly be exerted under the force of mastication that it is not worth taking account of; and again, some of the hardest and most impervious cements crushed under the least weight,—due to the fact that the harder a substance of the nature of cement is, the more brittle it will be.

The ammonia solution was strong. The majority of the samples showed disintegration, but only a few lost weight on the scales I used; but a different result might have been obtained with scales of finer adjustment. As the first test was for imperviousness, it will be used as a basis for the five classes into which the twenty samples have been divided.

Class I consists of three which show no penetration of coloring matter, viz, Agate, Caulk's Petroid, Ames' New Process Oxyphosphate of Copper. All of these are hard in texture, show no loss in ammonia solution, and but a slight disintegration of surface. They crush in a range from $3\frac{1}{2}$ to $4\frac{1}{2}$; Agate has a peculiar putty-like feeling in mixing and sets slow.

Class II shows but slight penetration, the degree being in the order read: Wilcox Impervious, Lynton (German), Harvard, C. A. Ash & Sons', Dentos. None of these but Lynton show loss in ammonia solution, and but slight disintegration. In texture all are hard, and

crush in a range from $\frac{1}{2}$ to 2, except Dentos, which crushed at $6\frac{1}{2}$.

Class III shows a penetration of about 50 per cent. The samples are Archite and Ames' Metalloid. Texture hard and medium hard, crushing at 1 and 4 respectively; losing no weight in ammonia; Archite showing no disintegration, and Ames' slight.

Class IV. Weston's Xenolite. Shows about 80 per cent. penetration; no loss in ammonia solution; slight disintegration.

Class V shows entire penetration of coloring, the intensity being nearly in the order named: Weston's Insoluble, Britton's, German Fused Oxid, Johnson & Lund, Aluminum, Columbia, New Departure, DeSano & Hussey, Baldwin's Hydraulic, Weston's Crown and Bridge. Five of them show loss in weight in ammonia solution; all are disintegrated on the surface. The texture is soft to medium soft; most of them are not dense, crushing in a range of from 2 to 8. These last two classes are hardly

worth considering except for temporary work. Some may be used in combination fillings where there is no exposure to fluids.

In class V, Archite deserves special mention, as it is a new product of Lee, Smith & Co. It is not an oxyphosphate of zinc. It is hard in texture, sets quick beyond plasticity, but is slow in hardening to its full degree. It disintegrates if exposed to the action of water immediately. The samples I have prepared show penetration of coloring matter, while those received ready-mixed from the manufacturers have not been penetrated by the anilin, nor have they disintegrated in a solution of soda bicarbonate. This would indicate that the manner of mixing had much to do with results.

The sole object of this paper is to attempt to get at what is best in cements for the purposes to which they are put. Discussion is invited, that points may be brought out which will call for further and more definite working tests.

CORRESPONDENCE.

A DENTIST'S OBSERVATIONS IN SIAM.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Having read with much pleasure and deep interest Dr. Wiksell's paper, "Hammer and Nails" (Cosmos for August 1902, page 867 *et seq.*), I shall endeavor to give a few interesting data of the people of this country—Siam. The subject is of importance to the profession and their patients in the tropics.

A few words in regard to the diet of Europeans here seem appropriate to begin with. Nearly everyone in the home land believes that the tropical climates are especially severe upon the dental organs. My experience has proved this to be true in some cases. For example, the constitution of a person coming here

from his native land must undergo an entire change of climate and diet. Most people can accommodate themselves to the heat of the tropics, but the diet here is so entirely different from that at home that the constitution cannot keep up to its former standard.

The diet of Europeans is controlled by Chinese cooks, who have had little or no training in that line. In fact, we are entirely at their mercy. Under such conditions I do not see how the constitution can remain sound and strong, and the teeth are sure to suffer. It is considered beneath our dignity to go to market to purchase our own provisions for the day; even if one did, the cook would probably

refuse to cook them. To keep in with society, and the cook, one must conform to custom. There is but the alternative between local provisions and canned goods to be relied upon, and certainly neither are conducive to good health and sound teeth.

Again, I find that proper prophylaxis here is not the rule, but the exception. No doubt many of my patients would try to refute this statement, still it is true. I have noticed that when there is proper care of the teeth here their condition compares well with that of teeth at home, the diet being about the same. In my opinion, the rapid decay of the teeth here is caused more by neglect of proper diet and proper care than by the climate.

As to the Siamese, though they have no system of dentistry, their teeth are good up to a certain period. Their diet consists of rice, fruit, fish, and vegetables. This food is not the destructive element, but the betel-nut chewing habit is. Remove this habit and furnish them tooth-brushes instead, then their teeth would be good, healthy, and strong. Betel-nut chewing is acquired in childhood. The natives claim it purifies their breath and keeps the mouth clean. But it is a case of one odor killing another. Take a child of about eight years, who

begins chewing betel-nut, lime smeared on cerea leaf, and tobacco. After exhausting the first mouthful he takes another, and so on through the day without cleaning his teeth. His white teeth become a trifle stained, and this stain is allowed to remain. By morning it is dry, and would take considerable brushing to remove, but no such attempt is made.

Day after day the accumulation continues until the teeth become red, and then black, with a very glossy, enameled appearance. This incrustation continues for years. The natives are not troubled with caries, but the time approaches when they suffer from a worse cause. Probably at the age of thirty they have an acute attack of pericementitis, caused by the deposits of lime beneath the gums; and this becomes chronic. They now seek aid at a drug store, and perhaps obtain temporary relief; but the cause is still at work, and in a short time pyorrhea alveolaris sets in, followed by the loss of the tooth or teeth.

I recall many cases where I have drawn a single front tooth and the rest of the teeth have fallen out so soon that within a year's time I have made full sets for the same patient.

PAUL T. CARRINGTON, D.D.S.

BANGKOK, SIAM, Oct. 28, 1902.

PROCEEDINGS OF SOCIETIES.

PENNSYLVANIA STATE DENTAL SOCIETY.

Thirty-fourth Annual Meeting.

THE thirty-fourth annual meeting of the Pennsylvania State Dental Society convened at Bedford Springs, Pa., Tuesday, July 8, 1902, at 10.30 A.M.

The president, Dr. M. H. Cryer, called the meeting to order, and Rev. H. B. Townsend, of Bedford, Pa., was called upon to invoke Divine blessings upon the convention.

Hon. John M. Reynolds, of Bedford, then delivered the address of welcome.

The vice-president, Dr. Nones, took the chair, and the president read his annual address. (Dr. Cryer's presidential address was printed in the February issue of the *Cosmos*, page 101.)

Dr. KIRK. This is a very excellent address to which we have listened, and

one that contains many suggestions of importance not only to the society, but to the profession throughout the state and beyond its borders, and it seems to me regrettable that we should enter into a discussion of it on the first reading of it. I therefore make a motion that it be referred to a committee to make a report and submit it to the society later on, and that the recommendations be discussed at that time.

Motion carried.

Dr. Kirk, Dr. J. A. Libbey, and Dr. Walker were appointed as the committee to consider and report on the President's Address.

Meeting adjourned.

At the afternoon session Dr. GEORGE F. ROOT, Philadelphia, read a paper entitled "Dental Education of Physicians," and Dr. A. H. GRUBB, West Chester, also read a paper on "Professional Progress."

TUESDAY—*Evening Session.*

The meeting was called to order at 8.30 P.M. by the president.

The minutes of the previous meeting were read by the secretary, and approved.

Dr. NONES announced that there would be a banquet on Wednesday night at the hotel, and that all members and their friends and the ladies were cordially invited. He also announced that the ladies would give a "pink tea" the afternoon before on the lawn at 5 o'clock to the members and friends.

Dr. NONES moved that the society extend a vote of thanks to the Rev. H. B. Townsend and to Hon. John M. Reynolds for the part they took in the opening meeting.

Motion carried.

Dr. E. C. KIRK, of Philadelphia, then gave an illustrated lecture on "Sialo-Semeiology."

Dr. M. H. CRYER, of Philadelphia, also gave an illustrated lecture on the "Sectional Study of the Anatomy of the Face and Head."

The meeting then adjourned until Wednesday at 2.30 P.M.

WEDNESDAY—*Morning.*

CLINICS.

The morning of the second day was devoted to the following very interesting clinics:

Dr. J. P. NICHOL, Philadelphia, demonstrated his method of removing the pulp of a tooth and filling the root-canal immediately. He anesthetizes the nerve with cocain, then removes the pulp, treats canals with formalin, and fills at once with gutta-percha. He uses ethyl chlorid to allay the pain incident to exposure. Dr. Nichol also opened a dead tooth with putrescent canals, and after treating the canals with formalin solution, filled them immediately. Dr. Nichol claims wonderful success from the use of formalin in treating root-canals.

Dr. M. I. SCHAMBERG's clinic consisted of treating a chronic alveolar abscess that would not respond to ordinary treatment. He amputates the end of the root by the use of a large surgical bur. The bur cuts the root in such a way as to leave the end smooth so that it will be congenial to the surrounding tissues. The end of the root may be located with a smooth broach, but even if there be no accurate method of locating the end, it can very readily be done after some experience. He then cleanses the infected space with euthymol. Dr. Schamberg says that nitrous oxid may be used to anesthetize the patient in these cases, but that it is very seldom necessary to resort to the use of an anesthetic.

Dr. L. FOSTER JACK showed his method of restoring the corner of a tooth. He first cuts the surface smooth with a diamond disk, then excavates a cavity without an undercut. He burnishes into this a platinum matrix, and after filling this smooth over with porcelain bakes it. He then selects a plate tooth the proper shape and color, and cuts off as much of the corner of that as is needed to restore the original shape of his tooth; after fitting this to the tooth, he waxes it

and the baked porcelain together, marking the edges of the porcelain so as to be able to place it back in proper shape. He then slightly hollows out both the baked piece of porcelain and the corner of the porcelain tooth, places in some lower-fusing body than that first used, and fuses the two pieces together. He then cements this in the tooth, holding it in position with a sand-paper strip until the cement hardens.

Dr. A. N. GAYLORD demonstrated the preparation of cavities in plate teeth by the use of the diamond disk. He uses the diamond disk to make the cavity and undercuts both.

Dr. W. V-B. AMES, Chicago, showed the method of mixing and manipulating his new process oxyphosphate of copper cement. He gave some very interesting illustrations of the effect of the atmospheric conditions upon cement.

Dr. G. B. STONE, Chicago, demonstrated the uses of the Turner furnace in baking porcelain work. He claims that the high-fusing body is very readily fusible in the Turner furnace, and demonstrated this to the satisfaction of all.

Dr. D. GENESE, Baltimore, gave an interesting clinic, taking impressions in plaster without the use of water. He uses "cementine," which allows the plaster to set very much slower, allowing time for manipulation in taking impressions of fractured maxillæ, etc. He also showed models and casts made from living subjects, showing how applicable the method is to extensive work of this character.

Dr. J. J. NELSON, Philadelphia, demonstrated the making and uses of a simple matrix for assisting in the filling of approximal surfaces of molars and bicuspid. He uses thin steel, and shapes one to fit the case in hand.

Dr. H. C. REGISTER gave a demonstration of his method of prophylaxis as he has practiced it for several years.

WEDNESDAY—Afternoon Session.

The afternoon session was called to order at 2.30 o'clock.

Dr. NONES, chairman of the Executive Committee, announced that the committee on the President's Address was ready to report.

Dr. KIRK, chairman of that committee, then read the following report:

REPORT OF THE COMMITTEE ON THE PRESIDENT'S ADDRESS.

BEDFORD, PA., July 9, 1902.

Mr. President and Members:

Your committee appointed to consider and report upon the President's Address submit the following as the result of their deliberations:

In pursuance of the President's suggestion, we recommend that a special committee of three be appointed to prepare suitable resolutions relative to the late Prof. Chas. J. Essig, and that said resolutions when adopted be spread upon the minute book of this society, and that an engrossed copy be forwarded to his family.

With respect to the status of the dental profession, we recommend that this society affirm its views on that important question by recording its belief in dentistry as a separate profession with a separate degree; that the D.D.S. degree should be attainable only as the culmination of a thoroughly specialized technical training, and that the basis upon which the superstructure of special training is erected should be a full knowledge of the foundation sciences of medicine, but not upon the curriculum which leads to the M.D. degree.

We commend the action of the Board of Charities and Correction of Philadelphia in establishing a department of the dental service in connection with the Philadelphia Hospital upon terms of professional equality with the other branches of medical and surgical service in that institution. We recognize in this action a practical appreciation of the value of efficient dental service in its bearing upon public health—a fact which is fully borne out by the excellent exhibit of results set forth in the annual report of the resident dental surgeon submitted in the address of the President of this society. We take pride in the fact that Philadelphia has taken the initiative in this matter, and we trust that her example may be generally followed by all municipalities in their efforts to ameliorate

the physical ills of the indigent and dependent portion of their population.

We fully approve of the recommendation of the President that the by-laws should provide an adequate method for calling meetings of the Council *ad interim*, for the transaction of official business, and we suggest that the Council be asked to frame a suitable by-law to that end and present it for enactment by the usual course of procedure provided for amending the by-laws of the society.

With respect to amending the dental law so as to include adequate provision for its enforcement, your committee is in hearty accord with the suggestions of the President to that end, but inasmuch as the Committee on Enforcement of Dental Law has taken steps to that end, and will present a report embodying a recommendation based upon its practical experience, your committee deems it advisable, as well as courteous, to refrain from offering any recommendation upon that feature of the President's address.

Your committee is unanimous in its approval of the recommendation of the President tending to the removal of the obstacles to membership now imposed by Article III of the By-laws, making membership in a local society or dental college faculty a prerequisite condition to permanent membership in the Pennsylvania State Dental Society; and in order that the aforesaid obstacles may be removed, your committee recommends that Section 1 of Article III of the By-laws be amended by striking out the word "associate," and that Section 7 of the same article be amended by substituting the word "permanent" for the word "associate" in the first line, and that Section 7 be further amended by striking out the words "associate members shall not be entitled to vote or to hold office."

We believe that the delegate feature should be maintained, in order that opportunity shall be afforded for the representation of local dental organizations in the Pennsylvania State Dental Society by delegates who may be empowered to act officially for and on behalf of said local dental organizations; but we feel that the present enlarged relations of the State Society, especially in its function of conservator of the legal aspects of our educational interests, demand that no unnecessary obstacles should be placed in the way of a free right of franchise upon the part of any legitimate practitioner in the State who may desire to exercise that right through the channel of membership in the State Dental Society, legislating as it does upon matters which directly affect the interests of all den-

tal practitioners within the borders of this commonwealth. The amendments suggested by your committee, while fully retaining the delegate feature for the objects stated, will have the effect of doing away with the associate membership and provide a means for attaining permanent membership upon the basis upon which associate membership is at present provided for.

Your committee concurs in the recommendation that the examination for license by the Dental Council should be uniform for all applicants who are graduates of a given college session, in order that the ends of equity may be fully conserved and to increase the stimulus to educational competition which the comparative results of a uniform examination test would afford to the teaching institutions of this and other states. Your committee therefore suggests that the Pennsylvania State Dental Society give careful consideration to this recommendation, and formulate their views in an appropriate resolution to be presented to the Dental Council of Pennsylvania.

Similarly your committee approves the recommendation that the dental law be amended so as to specifically require evidence of preliminary education equivalent to two years of successfully completed high-school work before the candidate shall be eligible for the professional licensing examination in dentistry—this suggested change being simply a specific statement of the standard with respect to the preliminary education under which the Dental Council is now working, and the standard also agreed upon by the National Association of Dental Faculties.

Your committee sympathizes with the criticism made by the President upon the present plan of admitting matriculants to dental colleges upon certificates from preparatory schools, instead of upon examination exclusively, but deems it inexpedient in the present stage of our development to suggest the adoption of any change in the plan now in operation. While the certificate plan does not wholly exclude the illiterate, it is by no means clear to your committee that the exclusive examination plan would not be open to a similar criticism unless safeguarded by details which would be cumbersome, and perhaps impractical, if effective.

EDWARD C. KIRK,
J. A. LIBBEY,
C. C. WALKER, *Committee.*

The report was on motion received.

The secretary then read the following communication from the Correspondent of the New York State Dental Society:

To the President and Secretary of the Pennsylvania State Dental Association:

35 W. 38th st., New York, N. Y.

DEAR SIRs,—At the May meeting of the Dental Society of the State of New York, the "Correspondent" presented to the society a report (see advance sheet of report inclosed; also note editorial in *Items of Interest* for June), in which report it was urged that the time had come when financial aid and the co-operation of other scientific bodies was a necessity to the advancement of our profession along the lines of pure and applied science. It was pointed out that our needs seemed to be fully met by the purposes of the Carnegie Institution at Washington, D. C., application having been already made for aid and co-operation from that institution.*

Pending the first meeting of the board of trustees of the Carnegie Institution in the autumn, a committee was appointed by our society (and a fund raised by subscription) to further the work, and to undertake scientific research.

Will you kindly consider the matter at your society meeting, and appoint a committee (with a fund, if possible) who might co-operate with our committee for the furtherance of this very desirable end.

The state committees could all work together in connection with a national committee, and in that way make the work symmetrical as well as national in its scope.

Also please consider the advisability of creating in your State Society a permanent committee on "Scientific Work or Research."

Kindly favor me with your opinion and advise me of any action taken by your society.

Very respectfully yours,

HENRY D. HATCH,

Correspondent and Chairman of Committee.

On motion of Dr. Broomell, the communication was received and the president directed to appoint a committee to look into the matter concerned in the communication, and be informed to act accordingly.

Dr. A. R. DRAY, Philadelphia, read a paper entitled "The Retention of Artificial Dentures."

NECROLOGY.

At this session the president appointed Drs. Swing, Nones, and Broo-

mell a committee to draft resolutions on the death of Dr. Essig.

Later this committee reported as follows:

WHEREAS, We have learned with sincere regret of the death of our esteemed fellow member and associate, Dr. Charles J. Essig, who for many years has been an active and earnest member of the Pennsylvania State Dental Society; therefore be it

Resolved, That in his death we have lost a member who was faithful and true to the interests of the organization, a credit to the profession, a wise counselor, and a generous friend.

Resolved, That in the deliberations of the society he will be greatly missed. His contributions of able and interesting papers added very much to the usefulness of the society, to its members, and, as a result, to the general public.

Resolved, That these proceedings be spread on the minutes of the society, and that a copy be properly engrossed and presented to his bereaved family, with the assurance of our earnest and heartfelt sympathy with them in the loss of their loved one. Our loss is mutual, but theirs is infinitely greater.

(Signed)

ROBT. H. NONES,

I. N. BROOMELL,

R. H. D. SWING,

Committee.

WEDNESDAY—*Evening Session.*

The members assembled in the banquet hall at 8.30 promptly and partook of the feast set before them by Mr. Beemis, proprietor of the Bedford Springs Hotel, before the meeting was called to order.

The president, Dr. CRYER, announced at 10.30 that they would go into business session for a few minutes and listen to a paper from HENRY BEATES, JR., M.D., Philadelphia, entitled, "Should the So-Called Fundamental Branches in the Study of Dentistry and Medicine be Taught by the Same Faculty?" (Printed in *Cosmos* for October 1902, at page 1011.)

Discussion.

Dr. J. A. LIBBEY, Pittsburg. From what I had heard of this paper before coming here I am somewhat disappointed in the reading of it, as I understood that some very peculiar and new

*[For the Correspondent's Report here referred to, see *Transactions of the Dental Society of the State of New York* for 1902; also *DENTAL COSMOS* for July 1902, page 753.]

ideas were to be brought out. I was feeling easy, as I was down to assist in the opening of the discussion, thinking that there would be an opportunity to take the other side and get up a good discussion. There is no better way to do this than to oppose the essayist's views, but in this case he has expressed my sentiments to the letter. This paper is the result of much study along this line, and I only wish that we had more such men in both professions. The essayist alludes to the necessity of the fundamental branches—*anatomy, chemistry, physiology, pathology*—being studied equally by both professions. There is no doubt that he is on the right line, and right here I might refer to the remarks of Sir Michael Foster, in welcoming the International Dental Federation to Cambridge. In the course of his remarks he compared professional education to a cone: The general preliminary education, he said, must be the base; next come the fundamental branches, but in order to bring the cone to an effective apex it must be narrowed down by a special education.

The essayist refers to commercialism. He calls it a pathogenic microbe. That is a good name for one of the main barriers to progress in both professions—commercialism on the part of the colleges. I have had students come before me for examination who would spell blood "blud," and I could enumerate numbers of instances just as bad, showing that the applicants were deficient in their preliminary education. You cannot teach these students the fundamental principles until they have a good preliminary education. It is just about as sensible to reason that you can take a child out of the primary department of public schools and begin to teach it algebra, geometry, and trigonometry. What could a teacher do with material of that sort?

As the essayist says, the degrees of D.D.S. and M.D. did not represent competency, and it was for that reason both professions went to the legislature and asked for legislation on this subject. As a result of this there is

legislation in nearly every state in the Union on this subject, and I am glad to see that some improvement is being made along that line. Another result is that the National Association of Dental Faculties have recommended and passed a resolution requiring a four years' course before graduation. It is true, I do not see the necessity of requiring a man to go to school a certain number of years. It is not the number of years he goes; what is wanted is the education. If a student can receive that education and pass the necessary examinations showing that he is qualified for the work, he is just as much entitled to the degree as the man who goes six years. We have had some students that, I believe, had they taken a twenty years' course could not have passed the examination. However, this is a matter almost impossible to settle satisfactorily, and I am glad that we are going to have a four years' course.

I want to say here that, so far as the dental colleges in this state are concerned, all five of the colleges have been favorable to the law, and the representatives of the faculties of these different schools have assisted the Legislative Committee in every way they could in having the law passed, and there has been nothing attempted since the passing of the law in which the State Board and the colleges have not worked in perfect harmony, so that we feel very much encouraged in that direction.

In closing, the essayist spoke of the time when each specialty shall be worthy of its own faculty. That is what I would like to see. I believe the fundamental branches can be taught by the same teacher, but when it comes to the practical work—preparing a man for his special line of work—it should be done only by those who are thoroughly proficient in that line. I have heard lectures to dental students from men who showed that they did not have a good knowledge of dental anatomy. These men were not competent to teach dental students. I hope legislation will continue on this subject until the standard will be raised much higher than it is at present, and

that the time will come when we will have a common board of examiners who will examine the students at the end of each term. My idea is to take the examinations entirely out of the hands of the schools. In this way the student could be advised as to his future course, and I believe that commercialism would be killed quicker in this way than any other, and that it would result in better colleges and better and more thorough men in our profession.

Dr. G. W. KLUMP being called upon, said that he had nothing to add to the paper. He only indorsed it in a general way as he understood it, but he did not desire to discuss the points brought out until he had read and thoroughly comprehended it.

Dr. WARREN. I enjoyed the paper very much. I think the society is indebted to Dr. Beates for coming here and giving us such a valuable contribution to our meeting. I am not prepared to discuss the paper at all.

Dr. H. N. YOUNG, Wilkesbarre. I was requested by the State Board to discuss that portion of the paper that referred to our work. You all know that the board is very careful about telling its actions to the outside world, and it occurred to me that, as I was the youngest member of the board and knew less about the workings, I was possibly selected for this duty for the reason that I did not know much to tell. My reason for consenting to speak for the board is that the first lesson I learned after being appointed to the board was that of obedience. The next lesson that I learned was submission. I was told that the board was to conduct the examinations of the applicants in a fair, impartial way, regardless of the school from which they came. Of course, I saw that this was necessarily so, and I submitted. I was told by Father Klump that the board was subject to all sorts of criticisms: criticisms from the older members of the profession, who, never having had to stand an examination, could not see why anyone else should stand examination before being allowed to practice. We should also be criticized by the students, who do not think that

they should be subjected to examination from the board after they have passed the college faculty examinations. We are subject to severe criticism from nearly all members of the profession. I have been on the board long enough to learn that we do not get the support from the profession that we should have.

Dr. REGISTER. I do not altogether agree with the essayist with regard to his idea of the teaching of the fundamental principles separately. I believe that it is necessary that the student of dentistry should study thoroughly the fundamental principles; I believe it is equally as necessary for the student of medicine, and I also believe that they should be one—one in purpose.

Dr. Beates spoke of the medical profession as a whole, making no distinction except with regard to dentistry. There are other specialties of no more importance in medicine than dentistry. Why not professionalize and lift it to stomatology? There are the rhinologists, the ophthalmologists, the dermatologists, and others that must have the fundamental principles thoroughly taught before they can contend with the special conditions that present themselves. I believe the time is coming, and I hope to see it, when the dentist will be the stomatologist, and all the specialists will go through the same course in the fundamental branches at the same school, and after they have learned these, their course will be by election to a final medical, surgical, or special.

Dr. AMES, Chicago, said that while he enjoyed it very much, and was thoroughly in sympathy with the views expressed in the paper, still his work was along a different line from teaching, and therefore he did not think he could add anything to the discussion.

Dr. GENESE, Baltimore. I think the doctor has given us some good ideas with regard to teaching the different professions. It occurs to me, however, that, rather than have a student go over these fundamental principles for several years before devoting time to the finishing touches as they are called, the old-time way would be better—that is for the

beginner to serve an apprenticeship in the office of an old practitioner, who could then soon learn his tendencies and his adaptability to the work, and in case he was seen not to be suited for the work he could be advised accordingly and thus save several years of preliminary study that would do him no good. Say a month or more time be probatory before the student signs an agreement with the practitioner, and if satisfactory a fee should be paid and proper articles drawn up binding on both sides for due performance of the contract. It also occurs to me that this would have a tendency to eliminate to a great extent the commercialism referred to by the other gentlemen.

Dr. BEATES, in closing the discussion, said that there was very little more to be added. He was very glad that so many who had spoken had agreed with him in regard to the principles he had endeavored to bring to their notice. He said that in the education of the specialist and the practitioner, there was certain work that was necessary to both, but their needs were so different that it would be burdensome for one to study all that the other did. He illustrated this by taking the specialty of the ophthalmologist and comparing it with that of the general practitioner. He said the line of study needed to be separate and distinct. In the application of the general principles the environments must be considered in which those principles would be advantageous. He compared the general practitioner's needs with those of the orthopedic surgeon, saying that these were entirely different, and illustrated the fact that their practice was necessarily so different as to require different after-knowledge by comparing the knowledge of the general practitioner with that of the orthopedic surgeon in the latter's work. He said that from his experience and study of the question he was convinced that the medical histologist could not teach the dentist histology as he should study it from a dental standpoint, and that the same rule would apply to all the other branches.

THURSDAY—*Morning Session.*

The meeting was called to order at 10 o'clock by the president.

The minutes of the last session were read and approved.

The society then listened to a paper from Dr. F. W. ALLEN, of Philadelphia, on "Mechanical Section Grinder for the Preparation of Microscopical Sections." (Dr. Allen's paper was published in January 1902 Cosmos, at page 27.)

Discussion.

Dr. DELONG, Reading. Dr. Allen has rendered great service to the profession in constructing a machine of this nature. His full and complete description of its usefulness leaves nothing for me to say. I think, however, I can appreciate the value of a machine like that to those members of the profession who are engaged in microscopic work. I think the profession is greatly indebted to him, and I predict the general use of his machine. I congratulate Dr. Allen on his work.

Dr. I. N. BROOMELL. Having had experience in this line of work, I would like to make a few remarks. First, I want to compliment Dr. Allen on his very intelligent description of the apparatus. Its usefulness cannot be overestimated. Anyone who has had experience in attempting to sectionize teeth by the old method will appreciate the value of this machine. The doctor in his written description referred to the dissection of teeth, and spoke also of the dissatisfaction commonly experienced. That is very true. In making sections of decalcified teeth, we only have the organic matrix left for study, and, while that is to a certain extent instructive, it does not give the information that we derive from a ground section in which we can study the organic as well as the inorganic tissues, and the cells as well as the intercellular substance.

Again, the machine offers the advantage of producing sections of equalized thickness throughout—always a desirable feature. It is almost impossible by the old method to grind a section the same thickness throughout. You may

approximate it, but it will not be accurate, and the enamel is quite likely to separate from the dentin before the work has been accomplished. I can see in this apparatus the possibility of studying pathological conditions, principally caries. The machine, as I understand it, cuts so smooth and fine and with such precision that in grinding down a section a part of which is carious, this will be preserved to a certain extent, and it can be studied in this way. Besides the usefulness of the machine in histological work, it will be of value in macroscopical study. In our school each year we require every student to grind down a certain number of teeth, to study the different tissues, with their relations to the pulp and to one another, and this apparatus will be of great benefit in this direction. Always laborious when done by hand, it is always more or less imperfectly done.

Another point that impresses me is that the machine measures accurately the thickness of the sections. We have been attempting to determine and speculating upon the size of the enamel prisms, of the dentinal tubules, etc., and I can see in this machine a possible way by which this can be accomplished. If, as Dr. Allen says, the machine will cut a section accurately to the $1/2000$ portion of an inch, I can see the study of hard tooth-structures much simplified by the use of the apparatus. I have nothing but compliments for Dr. Allen and his work.

Dr. R. H. NONES, Philadelphia. I do not rise to discuss this paper, but rather to compliment the author. Of the reading of the paper and the general description of the machine I heard very little. I was not especially attentive to it for the reason that Dr. Allen had kindly promised to give me a full description and demonstration of the apparatus privately.

Dr. M. I. SCHAMBERG, Philadelphia. I rise to express my gratitude to Dr. Allen for this excellent presentation to the profession. I want to make allusion to the need for such a device and the part it will play in encouraging research work. During the past few years I have been much

interested in the study of hypercementosis, or exostosis of teeth, and have attempted to make both a macroscopic and a microscopic observation of the various types of this condition. I found the preparation of specimens of tooth-structure for the microscope such a tedious task and involving so much time by the hand method of grinding the section between two stones, that I was compelled to discontinue the work. Often after spending many hours upon one section, just as it was reaching the desired degree of thinness it would disappear entirely from my view and be lost upon the floor. Dr. Allen's invention will serve to simplify the technique of preparing sections of teeth and bone, and will be heartily welcomed by all who are interested in this department of experimental research.

Dr. H. C. REGISTER, Philadelphia. I rise merely to express my gratification at being present and hearing Dr. Allen's paper and seeing the machine. I certainly think it will be a great help in the preparation of specimens for microscopical study, and its method of grinding will aid us in studying the anatomical relations of the teeth at small cost. This will be of great benefit to us in operative work, because many of us do not have the opportunity or ability to make sections for study, so that if we can have it done by a machine such as this, it will prove a great assistance to us, in that it will afford us the opportunity to study with the microscope a large variety of the different conditions of the teeth and apply it in our practice.

Dr. ALLEN. I feel complimented over the reception of my paper by the society. The gentlemen who discussed the paper brought out several points of advantage of the machine that I have not mentioned in my brief paper. I have nothing to add to what has been said, except that I believe that the carious conditions of the teeth referred to by the gentlemen can be very well brought out in specimens. So also can the stripes of Retzius be clearly shown in a carefully prepared specimen, as also the transparent zones of Tomes, and the fibers of Tomes can be

clearly brought out for study. Not only may the teeth be prepared for study by this machine, but also the animal tissues may be as readily prepared for microscopical study. I have been and am now at work on a machine that I think will be an improvement on this, one that will give a wider range of work, and I hope that the stimulus gained from the reception of the apparatus here to-day will help me to perfect a better and more complete instrument. I want to express my thanks to the members for their kind encouragement to me in my work.

On motion the subject was passed.

A paper was read by Dr. W. V-B. AMES, Chicago, on "The Manipulation and Care of Cements." (Dr. Ames' paper appears on page 178 of the current issue of the DENTAL COSMOS.)

Discussion.

Dr. GARDINER. I am at a loss to understand why the committee selected me to open the discussion of this paper, as I have never made any particular study of cements and have never experimented in the manufacture of them. It is a subject to which I have not given any special attention, as I use cements to a very limited extent. There is no doubt, however, that success in the using of cements is in a great degree dependent upon the manipulation of them, and the manner described by Dr. Ames is undoubtedly the proper one. I can very readily appreciate the advantage of keeping the liquid in a bottle such as he suggests, and I shall certainly try it. I am sorry that there have not been more improvements made in cements in the past, because it seems to me they would be a very desirable class of filling material if we could obtain the much desired results.

Dr. H. E. ROBERTS. I know little about cements, particularly the manufacture of them. I would, however, like to call especial attention to what Dr. Ames has said about the care of the liquids of the cements, particularly after the bottle has been opened. The liquid is readily hygroscopic—taking up moisture, and on a dry day giving it off—making it a heavier liquid. The working qualities of

the liquid depend to a large extent upon the amount of water there is in the phosphoric acid. We notice that on a warm day in the summer, if we attempt to use cement that we have been using all the winter, we can hardly use it at all—simply owing to the absorption of moisture from the air. I believe it is almost impossible to make a cement that will work equally well in all conditions of atmosphere. Some few years ago a manufacturer of cements sent me some samples of cement, told me to test its working qualities, and asked me to demonstrate it for him at the next state meeting. I tried it and it worked beautifully in the office, and so I consented to demonstrate it for him. I took it to the meeting. The temperature was different, the atmospheric conditions entirely different. I attempted to mix some of the same cement that I had been using in my office, which had set nicely in five minutes, but the same cement there was plastic after fifteen minutes. I did not understand it at the time, but found out afterward that it was entirely due to the different atmospheric conditions.

In the mixing of cement, thorough spatulation is a great factor. If we take small amounts of the oxid and add gradually to the liquid, being careful to thoroughly spatulate it, the two ingredients can be brought into such close adaptation that you get a chemical combination of them; whereas, if you take great bulks of the oxid and add to the liquid, and mix "any old way," you will not get the chemical combination and the result will be far from satisfactory. With regard to the matter of cleanliness, it seems hardly necessary to speak, and yet it is surprising what we find in some offices. I have seen operators who would take a great bulk of liquid and oxid on a soiled slab, and with a soiled spatula mix a bulk of cement and pack it into a tooth, take the next patient, without even washing the slab and spatula, and mix more cement on the same place and pack into another tooth. Now, how any man can expect any success from cement used in this way, I do not see. The doctor did not touch upon the setting qualities of ce-

ments, so we will not go into a discussion of that feature.

Dr. ALLEN. The practical value of cement is an established fact. One point brought out by the essayist is with regard to its setting so quickly that we are annoyed in the placing of an extensive piece of work. I have used a thick glass slab, chilled with ice-water and dried thoroughly, to mix the cement on, and find that this will give me about twice as long for its manipulation. It retards the setting to such an extent that I have no trouble in adjusting large pieces of work by the use of the chilled slab. You all know that steel spatulas oxidize readily, and should they be used it is a good method to polish them before use. With regard to the use of slabs, it is best to have a number of them perfectly cleaned. The glass ones are so cheap that I think it a good idea to use a fresh one with each mix. I greatly appreciate Dr. Ames' point with regard to the bottle for keeping the liquid in, and I shall certainly try it. We have often noticed in new packages of cement, especially with the Harvard, that there was a certain amount of crystallization at the bottom of the bottle. I want to ask Dr. Ames if he thinks that this interferes with the value of the cement.

Dr. CRYER. I think that Dr. Gaylord can give an interesting experience that he and I had with the setting of cement.

Dr. GAYLORD, Philadelphia. So far as my experience is concerned I think I could relate many more failures than successes in the use of cement. While I have used cement considerably, and have done more or less experimental work along this line, still I have nothing new to present or anything of particular advantage to relate at this time. Dr. Ames has given us many good points regarding the mixing and working of cements, for which I feel very grateful. I would like to ask Dr. Ames if he would advise the use of the so-called Spooner cement pad, made of oiled paper, whereby the smeared piece can be torn off leaving a clean surface for the next mix. It has been a question in my mind whether by mixing

on such a surface particles of the paper might not be rubbed off and incorporated in the cement, thereby injuring it.

I think the experience to which Dr. Cryer refers is to some work done by him some time ago where Weston's cement was used in the labial surfaces of the lower incisors—the work being so thoroughly done that the lasting quality of the cement was admirable.

Dr. CRYER. The incident to which I referred, and wanted Dr. Gaylord to relate, was a case of complicated fracture of the mandible. As it was my intention to set a splint which extended from the second and third molars of the left side to the second bicuspid of the right side, a large quantity of cement was required, and it became set before it could be properly placed. Dr. Gaylord suggested that the flat surface of a bottle filled with ice-water be used instead of the glass mixing slab, and in this way I was enabled to mix the proper quantity of cement, and place it before it began to set.

Dr. LIBBEY. One point that Dr. Ames brought out in his paper I would like to lay stress upon, and that is the method of mixing—taking a small quantity of the oxid and mixing it thoroughly in the liquid, then taking another small quantity, and so on until you have the required amount. In this way you get a true chemical combination of the two ingredients, and you can keep the cement in a plastic state much longer. With regard to the use of the water bottle, as Dr. Ames says in his paper, the moisture from the bottle will be taken up by the liquid and in that way it affects the setting of the cement. Is that not so, Dr. Ames?

Dr. AMES. Yes.

Dr. REGISTER. I think that from the beginning of the mixing of cement until it perfectly crystallizes the manipulation of it has as much to do with the result as the cement itself. I think the same thing with regard to gutta-percha. Both are undoubtedly excellent materials for filling teeth, but many are not successful in their use because the material is not properly handled. It is a very easy thing to destroy the vegetable matter in

gutta-percha unless a great deal of care is used in preparing it for the filling. I have made many experiments with cement crystallization, mixing it in many different ways, and under different conditions, such as in water, in a closed room, in the open atmosphere, and crystallizing with a blast of hot air blowing on it. I find that to have hot air blown on it gives bad results. We want to allow the union of the two ingredients to take place naturally. I do not want to deprive Dr. Gaylord of any honor, but you will find an article published in the DENTAL COSMOS some years ago [see vol. xxxv, 1893, page 330] in which I suggested the use of the cold bottle for mixing cement upon. A slight film of glycerin on the side used for the mixing will prevent moisture condensing on that surface of the bottle.

Dr. W. V-B. AMES, Chicago. Regarding Dr. Allen's point in reference to more or less crystallization taking place in the bottom of the bottle while the cement is yet new, it is to be presumed that when the material was placed in the bottle in a homogeneous condition it was considered to be the correct combination. If, then, in the course of time some of the salts crystallize, the remaining liquid cannot have the same working qualities as originally intended. So, if it was originally the correct combination, the crystals represent a damaged condition. There being this tendency in the liquids of the high-grade cements, I strongly advocate the use of the glass-capped container mentioned in the paper.

The paper pad referred to by Dr. Gaylord is certainly a convenience, and I do not think can affect the setting of the cement. For a creamy mix I think the pads are quite practical, but for a stiff mix I much prefer a rigid slab.

We all know that it is difficult to get the best out of cements in midsummer. I am sure that we do our best cement work in the winter. We can set large bridges satisfactorily in the winter, whereas we cannot without great difficulty and hazard do the same properly in midsummer. I would feel safer with the cold water bottle in winter, if I wished

extra-slow setting. The danger of the condensation of moisture derived from the atmosphere in summer will have the tendency to quicken the setting of the cement after it has left the cold surface, and this additional water not only weakens the cement, but increases the tendency toward shrinkage.

By the method of mixing described in my paper, mixing a small portion of oxid at the beginning and spatulating that to the extent of effecting the solution of a considerable portion of it, making what I call a "flux" for the mix, and continuing with small additions of the oxid, the setting will be most satisfactorily retarded, and the resulting cement will be, I believe, the best obtainable under the conditions.

On motion the subject was passed.

Dr. EARL C. RICE, Philadelphia, not being present, his paper on "Recurrent Caries" was read by the secretary. (Dr. Rice's paper appears on page 186 of the current issue of the DENTAL COSMOS.)

Discussion.

Dr. ROBERTS. Hearing this paper for the first time and being called upon to open the discussion on it is, I think, hardly fair. However, a great deal may be said on recurrent caries. The essayist accepts Miller's theory, and then says that the success of the filling depends upon the mechanical adaptation of the filling material, and the preparation of the cavity. Perfect mechanical adaptation of a filling means that it shall be absolutely impervious to moisture at the margins, and that the cavity shall be hermetically sealed; then an absolutely smooth margin between filling and cavity margin. If we have this condition, and accept Miller's theory, we have reduced the liability to recurrent caries very largely, because, according to that theory, there must be some place for the accumulation of food to produce fermentation and for the production of bacteria to attack the enamel, or there must be places for the lodgment of bacteria where they can grow and develop and attack the enamel structure. If the filling is a perfect filling—fitting

the cavity, and margins perfectly polished—we have eliminated very largely the conditions favorable to the progress of decay according to Miller's theory.

The preparation of the cavity to avoid the crumbling of the enamel is also a very important factor. The paper speaks of cavity preparation with regard to the enamel prisms. The enamel should be cut so as to follow the enamel rods—on a line from the surface to the center of the tooth. In these conditions the filling material is better adapted to the structure, and is less liable to give way than when the enamel rods are cut diagonally across.

The selection of the filling material is also another factor in filling a tooth. It must be selected to suit the character of the cavity and also the conditions of the mouth. I believe fully that, under certain conditions, the saliva of the mouth has an antiseptic property; for instance, there are mouths where the conditions seem very favorable to the growth of bacteria and yet there is a perfectly healthy condition there. I believe that there is something in the chemical composition of the saliva which makes it antiseptic—not necessarily germicidal—which prevents the growth and development of bacteria. If we do not recognize the condition of the saliva, but place gold and amalgam fillings in a mouth where decay is progressing rapidly, we invite a recurrence of decay, no matter how carefully and thoroughly our filling is inserted. The proper selection of a filling material is of almost as much importance as careful manipulation. Now, if we can carry that mouth along for, say, a year with gutta-percha or cement, watching the character of the saliva, we can then put in our permanent filling with greater assurance that it will remain permanently. The finishing of a filling always plays an important part in preventing the recurrence of caries. I believe that if as much attention were paid to the finishing of amalgam fillings as is paid to gold, they would save teeth just as well. I venture the assertion that ninety-nine per cent. of the amalgam fillings put in are not finished. A cement fill-

ing will also last much longer when properly finished than when it is not.

Dr. DEPUY. I know this is a subject that could be discussed very extensively, and one which we like to think about, but realizing the fact that we are all tired and would like to have the discussion brought to a close at this point, my remarks will be brief. The subject calls for reconsideration of everything that we have studied in operative dentistry and pathology. I had not the opportunity of seeing the paper before it was read, and consequently am not properly prepared to discuss it. I admire the enthusiasm of the author in reminding us of our shortcomings, but it would be impracticable to attempt to review all the facts that the subject offers from an operative standpoint. Of course, every time we hear a paper on this line we are reminded of our shortcomings in operative procedures, and also of our mistakes in the use of materials, but this is a question to be largely governed by the special conditions that present themselves. This is left to our own judgment, and should be decided upon after careful study of the conditions. There is no well-defined rule that we may follow in this work. It is left to our individual judgment as to the best methods of procedure and the materials to be used.

Dr. GARDINER. I cannot agree with the essayist in a number of points advanced in his paper. If I could have had an opportunity of reading the paper beforehand and studying it I could have had more to say, for there are many points involved in which I have been very much interested and of which I have made a careful study for several years, particularly in relation to the recurrence of decay at the margin of fillings. I do not agree with the conclusions reached as to the cause of recurrent decay at the margins. My experience would indicate very strongly that the principal cause of decay at the margins of fillings is not the fault of the filling material, but rather the failure to change the conditions which primarily induced caries. It is only reasonable to suppose that if, after filling a tooth, and no mat-

ter how carefully you manipulate it, you still leave the same conditions existing that caused the decay in the first instance, the decay will recur, unless perchance the oral fluids and the conditions in the mouth have changed from those promotive of decay to those of resistance to decay, as we often find. But if you still have the conditions as at the first, you will surely have recurrence of decay. I think the only sure method is to so prepare the cavity that the margins are extended beyond the danger-point. Of course this would not be practicable in a good many cases, because it would necessitate the cutting away of too much tooth-structure. It would be better to have recurrent decay and refill than to greatly extend the margins of small cavities, because in the meantime the conditions may have changed so that they resist instead of induce caries, on account of the changed condition of the fluids of the mouth. If the margins are extended so that the conditions are changed and carried beyond the reach of the conditions which primarily caused the decay, and the work is thoroughly done, you are almost absolutely sure of preventing a recurrence, and that is the only method that in my experience will prevent it. Under these conditions any material will prevent decay, provided it will exclude air and moisture and the interdental space is preserved.

As to the statement that pink gutta-percha is always a perfect and durable preserver: In many mouths I have found that pink gutta-percha will fail quite as quickly as white gutta-percha.

My experience would not lead me to agree with the essayist with regard to fractured enamel margins. I think the preservation of the margins is due to the proper and skillful manipulation of the material and the preparation of the cavity, and not to the causes indicated by the essayist. Another point in regard to his remarks on the enamel rods: I do not think it essential from my experience to prepare the margins to suit the enamel rods. In the preparation of a cavity I shape the margins in any way that will carry out my design of the

shape of that cavity without regard to the position and angle of the rods. I think it is more essential to have the angle of the margins in the proper relation to the adjoining tooth than in relation to the enamel rods. Of course it would not be good practice to bevel the enamel toward what might be called the dentinal margin, because that would leave overhanging edges of enamel. In the preparation of an approximal cavity I always try to secure that condition that will protect the surfaces of the tooth.

Dr. REGISTER. I enjoyed the paper, also the discussions. With regard to the remarks of Dr. Gardiner with relation to the marginal work, I agree with him that we all undoubtedly prepare a cavity as he suggests, trimming the margins from the periphery toward the center when gold is used; when, however, I am placing a material lacking in edge strength, I do not prepare the cavity in a like manner. Regarding gutta-percha, my experience has been that it is a good preserver of the teeth, one of the best materials for that purpose that we have in use. I have never seen recurrence of decay in a cavity properly prepared and filled with gutta-percha, provided it was of a good manufacture. With regard to the "extension for prevention" theory, I believe that there is often a prohibitory as well as a progressive influence taking place in the teeth and in the environment, and frequently by the proper treatment the tooth can be brought back to a normal condition without cutting away so much tooth-structure. Frequently the conditions of the fluids and surroundings are changed so that the tooth can be filled without loss of an unnecessary amount of tooth-structure. This reparative change will bring about a healthy condition of the former incipient caries. We all know that the teeth receive their nutrition like all other tissues of the body, and I believe in numerous cases the vitality may be restored in this semi-deterioration, with a restoration to normal conditions. This of course embodies an internal and an external balance.

Adjourned.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, October 21, 1902, at the New York Academy of Medicine, 17 West Forty-third street, New York city, with the president, Dr. Hodson, in the chair.

The president announced the death of Dr. O. E. Hill of Brooklyn, which had occurred since the last meeting of the society. The president stated that as Dr. Hill was one of the leaders in our professional work he had appointed a committee—consisting of Drs. Jarvie, Perry, and Walker—to prepare a report on the death of Dr. Hill.

The report was then read by Dr. Perry, in the absence of the chairman of the committee, Dr. Jarvie.

On motion of Dr. Carr, the report was adopted by a standing vote.

Dr. W. J. Turner, on behalf of Dr. Hill's family, presented a beautiful specimen of carved wood denture to the society, which was on motion accepted with thanks, the secretary being requested to write Dr. Hill's family acknowledging the gift.

Dr. Carr, on behalf of Dr. J. L. Hitchcock of Hartford, presented to the society a portrait of the late Dr. Riggs, which on motion of Dr. W. W. Walker was received with a vote of thanks.

Upon request of the president, Dr. Hitchcock, who was present, explained that Dr. Riggs had had the portrait sketched shortly before his death and had told Dr. Hitchcock that he considered it was the best portrait he had ever had taken.

On motion of Dr. Walker it was ordered that a tablet be placed on the frame stating that the portrait was presented by Dr. Hitchcock, and that Dr. Riggs was the originator of the method of treatment of pyorrhea alveolaris which had associated his name with that disorder, known as Riggs' disease.

Drs. Wm. B. Dills of Brooklyn and Dr. Clarence M. Masters were balloted for, the former for active and the latter

for associate membership, and were duly elected.

The paper of the evening, entitled "Reflex Neurosis," was then read by the author, Dr. H. CLAY FERRIS of Brooklyn, as follows:

REFLEX NEUROSIS: WITH CLINICAL ILLUSTRATIONS.

My object in reading this paper is to call your attention to some phenomenal manifestations of the nervous system under inflammatory processes, and to illustrate by the citation of three clinical cases how closely allied are the regions of the cranium practiced upon by the dentist, oculist, aurist, and rhinologist, and how necessary it is for specialists to work harmoniously.

I will take up these regions in the order mentioned:

CASE No. 1.—A paresis of the external rectus muscles of the right eye, due primarily to an alveolar abscess over the upper second bicuspid of the same side, resulting in an empyema and consequent irritation of the superior maxillary division of the fifth nerve.

Symptoms, diagnosis, and treatment. Mrs. G., age about thirty-five years, presented herself for examination on May 31, 1901, in an anemic condition, suffering apparently with a pericementitis about the root of the upper right second bicuspid, stating that the tooth had been devitalized two years, with a cavity in the posterior approximal surface, unfilled. The tooth was sore to the touch, with no swelling and no discharge of pus. These symptoms were treated with counter-irritants and a light antiseptic dressing in the root-canal. Constitutionally, a laxative and ten grains of antikamnia were prescribed. The patient returned the next day still suffering and complaining of an itching sensation over the region of the antrum, and insisted upon having the tooth extracted; which operation was performed by Dr. C. J. Mapp, and the socket probed, but no opening into the maxillary sinus was found. All

pain disappeared, the socket healed, a month expired and the patient became suddenly cross-eyed. She presented herself to Dr. H. D. Schenk, oculist. He examined the eyes and found nothing abnormal in his region to cause the paresis, and he recommended that she have a trans-illumination examination made. Accordingly she called at my office, and upon examination with an electric lamp there was found to be pus in the antrum.

An operation was recommended, and this was performed the following day. The maxillary sinus was entered through the canine fossa, with an electric trephine, enlarging with a trocar, liberating about two drams of pus. The antrum was drained with a normal salt solution and one per cent. hydrogen dioxid neutralized with bicarbonate of soda, at a temperature of 105° F., and a rubber drain-tube introduced. A syringe was furnished the patient with which she used the above-mentioned solution three times a day. Three days after the operation the oculist reported an esotropia of forty-eight to fifty degrees. In twenty-one days, the secretion of pus having ceased, the drain-tube was removed and the wound healed. At that time there was an esotropia of sixty degrees and the patient was left in the care of the oculist, who after one year of local stimulation by stretching the muscles, brought the eyes to an esotropia of three and one-half degrees at a distance, and by the aid of prisms the patient was able to see comfortably.

Neurology. By tracing an impulse received by the anterior or posterior dental branches of the superior maxillary division of the fifth, we find that it communicates through the Gasserian ganglion with Meckel's ganglion, which receives its motor filaments from the sixth or abducens nerve. As the external rectus muscle is supplied by the sixth nerve, with its vaso-motor impulse, we may reasonably trace our reflex in this way.

CASE No. 2.—Symptoms of mastoiditis due to a devitalized nerve in a putrescent condition.

In this case you will have to make your own diagnosis, as there are no facts rela-

tive to the operation other than the statement of the patient. It may throw some light, however, upon the fact that the aurist too frequently finds no pus on opening the mastoid cells.

History, symptoms, and treatment. Mr. D., age about forty years, presented himself January 30, 1902, in a physically depleted condition two weeks after an operation for mastoiditis on the left side, which was still causing him pain. His teeth were examined, the lower left second bicuspid was found devitalized; a stream of hot air upon it gave him pain in the mastoid region. The tooth was not carious. It was opened, and the patient expressed a sense of relief in his mastoid. The root was carefully cleaned with pyrozone three per cent. neutralized with bicarbonate of soda, and an antiseptic dressing of formalin twenty per cent. and aristol was introduced with a cement stopping. This strength was used as an experiment, and the patient was instructed to return the next morning, which he did, saying he had spent a wretched night with his ear. The dressing was removed and again his pain ceased in the mastoid region. The treatment was continued with a one per cent. solution of formalin and aristol, and he had no more pain. The root-canal and cavity were filled.

Before completing the treatment of this tooth the patient complained of pain over and posterior to the right mastoid, and was very much alarmed, stating that the sensations were the same as preceded the trouble on the left side. The right side of the oral cavity was examined, and there were found two devitalized molars which had been treated. The molars were opened and sterilized, and the pain in the mastoid entirely disappeared. These symptoms were reported to the aurist and the patient was saved from an operation on the right side.

Neurology. In this case we find that an afferent impulse arising in the inferior maxillary division of the fifth can be traced through the sensory fibers to the otic and Meckel's ganglion, and anastomosing with branches from the sympathetic to the internal structure of the

ear as well as the integument of the scalp in the mastoid region.

CASE No. 3.—A neuritis of the superior-maxillary division of the fifth nerve, due to a traumatic irritation of the nasal branch of the ophthalmic division following an operation in the nares.

Symptoms. Mr. W., age forty-five years, presented himself for examination accompanied by his physician, a rhinologist. He was partially under the influence of morphin, but was suffering acutely. The physician stated that he had removed a portion of the middle turbinated bone the previous day, and the neurotic conditions had developed during the night. The location of the pain was in and about the upper first and second molars on the same side as the operation. On examination there was found a small cavity on the posterior approximal surface of the first molar. The gum tissue was hypersensitive and the teeth very loose, the patient being unable to bear the touch of a napkin.

Treatment. The mouth was sprayed with "Mu-Col" solution, one dram to the pint, at a temperature of 105° F. Steno's duct was dammed with cottonoid, and the buccal surface of the gum dried with a hot-air spray. The following solution was then applied:

R—Gelatin, sterile, gr. xxx;
Sodium chlorid, gr. viij;
Carbolic acid, ℥ ij;
Beta eucain hydr., gr. viij;
Cocain hydr., gr. xv;
Menthol, gr. v;
Alcohol, dr. iv;
Water, dist., ad oz. iijs.

After five minutes it was possible to remove some deposits of salivary calculus about the affected teeth, and to partly prepare the cavity mentioned, which was treated with carbolic acid and filled with Iodo-formagen cement. The gums were then painted with a ten per cent. solution of potassium permanganate, whereupon the patient was relieved from his acute suffering. The muscles of the face were sore to touch, showing that the seventh nerve was receiving some of the reflex, and an ointment of—

R—Ichthyol, dr. j;
Lanolin, oz. j.

—was applied and covered with a bandage. Constitutionally, this prescription was given:

R—Trional, gr. xv;
Caffein citrate, gr. vj.
Div. chart. no. iij.

Sig.—One every half-hour in hot milk.

The patient took two powders and slept eight hours that night, and on the following day the sensitive condition had disappeared, and the teeth, though sore to masticate upon, were firm in their sockets.

Neurology. We find here a more simple reflex, as the impulse arises in the nasal branch of the ophthalmic division of the fifth, thence to the Gasserian ganglion, back through the superior maxillary division to the anterior and posterior dental branches.

These cases are but instances of a number that undoubtedly are recalled by everyone present, and while our tendency is to criticize our brethren in the other specialties for not recognizing our own, *we* need stimulation to more carefully study and solicit the assistance of our fellows in finding the remote causes for neurotic manifestations in our own region.

Discussion.

Dr. PERRY. I want to commend the very clear and scientific manner in which these cases are presented. It is certainly very satisfactory to all of us. I have no doubt that there are many of these cases coming under our notice that we do not fully recognize.

Dr. HART. I would like to say "Amen" to the remarks of the last speaker, and while the reflex neuroses recorded and reported by our essayist are extreme, there are unquestionably many more reflex results of a milder character from dental irritations than we as a profession are willing to concede. Not only are these reflex neuroses possible, but their probability is so great that we should recognize them, and not permit patients to retain irritants in their mouths, which I fear we sometimes have been guilty of doing. If two of the papers read at our state meeting last May are correct in their conclusions,

then some of the standard root-canal fillings are not as successful in the maintenance of asepsis in the roots of teeth as we have assumed them to be, and I think it very probable that many pulpless teeth are causing reflex irritations. If those teeth are permitted to remain, the results are surely disastrous to our patients. In two of the instances cited by the essayist to-night (I refer more particularly to his second case) he was fortunate in finding roots that had been unfilled, and consequently he was able on opening those teeth to obtain relief almost immediately; but if he had opened into a tooth that had been treated and the root partially filled he would have been at a great loss in making his diagnosis. We all know as practical dentists, even when we assume that a pulpless tooth is a source of irritation, how easy it is at the start to get into and remove a portion of some canal fillings, but in the last third there is extreme difficulty in removing certain fillings. A cause of failure often is where the root-filling has failed to obliterate the last third of the space.

Dr. SANGER, Orange, N. J. Reflex disturbances have been recognized for a long time, and the essayist is very clear and concise in the statement of these particular cases. It is fortunate for us, if the papers Dr. Hart refers to are correct in their assumptions, that there are not more of our chickens coming home to roost. It is certainly a fact that of thousands of dead or pulpless teeth being carried about to-day, very few are really giving trouble, and so, while it is wise for us to recognize whenever we can reflex disturbances from these causes, I do not think we need to lose heart or abandon our present practice, or pronounce a failure the practice of devitalizing teeth and filling the canals because we have some that give reflex disturbances. While I am grateful to the essayist and to anyone who holds before us a proper signal of danger where danger exists, we have also need to take care not to be too greatly frightened and to abandon practice which has thus far proved largely successful.

Dr. RHEIN. The paper that has been read to us I think is a very interesting and a very timely one, embracing a subject that is considered too infrequently, not only among dentists, but among other branches of the medical profession. It brings up a subject that demonstrates *per se* the relationship to medicine which our specialty holds. It proves, if we desire to practice dentistry as it should be practiced, that we must possess a certain amount of knowledge of the entire human body. I say this not with any idea that it would be combated, but to bring up the other point, the necessity of the medical profession having a proper knowledge of the mouth—which they fail to have to an extraordinary degree in this section of the country, due to a faulty education.

As to the remarks of Dr. Hart, I personally do not believe that the papers Dr. Hart spoke of prove anything. I think they were theoretical in the extreme, and everything that was assumed, especially by the gentleman from Canada, remains to be proved, and personally I do not believe it will be proved. I do approve of one of the points made by Dr. Hart—that those we consider the best men in the profession, the ones who have made American dentistry respected the world over, have been led to place a great value on the life and preservation of every tooth in the head. That has been carried to such an extent that men have often said that no tooth should ever be sacrificed or lost, and it is a point of warning held out by Dr. Hart that I would echo very strongly. The teeth have a very great value in the human economy—no one appreciates that more than we as dentists; but as dentists practising a specialty of medicine we are all in danger at times of overvaluing that part of the body on which we happen to be practising, and this word of warning that we should not value any part of the dental economy where the life of the body itself is at stake is not only timely, but a very valuable caution to the very best dentists—those men who are a pride to the profession and to whom it is one of the greatest pains to be compelled to

authorize the loss of one of the natural teeth.

In regard to the other point of Dr. Hart—the difficulty of keeping a pulpless tooth in a condition free from irritation—I take decided exception to his line of argument. I do not believe that the paper this evening can be made to cover any such field as that. During the twenty-odd years that I have been engaged in practice I have seen a number of cases of this kind, and I have yet to see demonstrated one where the neurosis can be directly attributed to a pulpless tooth on account of any purulence in the canal, if the canal has been properly filled. I believe, furthermore, that there is no reason why all canals, with a very limited exception, cannot be first properly cleaned and then filled. It would take too long to go into that question in detail; the point I wish to make is that while there may be a very limited percentage of teeth in which this is impossible, those are the teeth that may have to be sacrificed; but the view that Dr. Hart takes I cannot accord any place in the operative technique of the present time in root-canal cleansing or filling.

I wish to say a few words further in regard to the lesson this paper should convey, and its timeliness, which concerns us more essentially. I have seen a great many of these cases. Hardly a month goes by, I may say, in which they are not brought to my attention, and in all of them there stands out this one feature—the faulty education of medically trained men in regard to what the physiological condition of the mouth is, what it is intended for, and the anatomical relations of the mouth proper. Having never been educated to properly appreciate the condition of the mouth in health, it is very unlikely they should have any knowledge of the conditions in disease. It is due to their ignorance—not intentional, but the faulty curriculum of medical institutions—that this trouble is made as severe as it is. We could all cite cases bordering on those so beautifully depicted by the essayist and so scientifically portrayed to us as far as the etiology is concerned.

The second case is especially an interesting one to me, because I myself have seen a number of cases that closely resemble that one, where they demonstrate that lack of medical knowledge. The main point we should learn from this paper of Dr. Ferris, is that as dentists, when we come in contact with cases of this kind, we have before us the absolute necessity to educate to a certain extent the medical men we come in contact with, in regard to what they ought to learn about the mouth.

Dr. WALKER. I think the essayist deserves the praise and thanks of this society for presenting a paper of this kind. While Drs. Hart and Sanger were speaking there came to my mind an occurrence that happened here when Dr. Grevers of Amsterdam presented a little instrument for detecting the life of the pulp in a tooth. A few days ago a patient was sent to me by a surgeon on my street. The patient had come from Pottsville, Pa. She had a bridge removed from her mouth, and she had *tic douloureux*, as the surgeon called it, and it traveled to the other side of her face. On that side were two gold crowns. The surgeon said he would like to have the patient see me in regard to those two teeth. For the life of me I could not tell whether those teeth were dead or alive. The patient said the dentist who crowned them on the other side of the mouth had put a crown over a live tooth. I could not tell with a very strong and powerful electric light, which is almost an arc light, whether either tooth was dead or alive by any test applied to them. Now if I had had Dr. Grevers' little electric instrument that he showed here, I could at least have told whether there was life in those two teeth. I immediately communicated with Dr. Carr, asking him, if Dr. Grevers had already left for Amsterdam, where I could procure one of those instruments; and if a case of that kind presents again I shall be able to determine whether the teeth are alive. I would have had to take off those crowns and go to a great deal of trouble. The patient could not stay in town, but was to return again for the operation.

Papers of this kind bring out just such cases, and we should all pay special attention to them.

Dr. FERRIS. In answer to Dr. Hart, I think he overlooked one part of my paper when he mentioned the fact that the teeth had not been filled. On the right side, in the second case of mastoiditis, the root-canals of both molars had been filled, and when I opened the teeth there were large silver fillings in both cavities, and there was a very putrescent odor coming from them; the root-canals were filled with chloro-percha. As soon as I opened into it, the sensation disappeared in the mastoid region.

Dr. Sanger has apparently missed the point of my paper. I did not intend to place myself on record as being opposed to the devitalization of nerves. His remarks seem to be foreign to the subject.

In the case of mastoiditis, on the left

side the operation was performed by two of the leading surgeons in Brooklyn. After my report to the surgeons, I received a very pleasant reply; so I think I opened the eyes of that particular surgeon to the fact that in diagnosing that man's case he had neglected to have the man's teeth examined. The patient was a leading lawyer of this city, and he was laid up about six weeks. He had to undergo a second operation before a healthy union took place. In this case the symptoms were so complete and made such a conclusive story that I thought it would be of interest to present it.

A vote of thanks was offered to Dr. Ferris for his excellent paper.

Adjourned.

ELLISON HILLYER, D.D.S.,
Editor N. Y. Odont. Soc.

UNION CONVENTION OF THE SEVENTH AND EIGHTH DISTRICT DENTAL SOCIETIES OF THE STATE OF NEW YORK.

(Continued from page 150.)

Dr. C. W. STANTON, of Buffalo, then gave a talk (an abstract of which follows), entitled

SUBSTITUTION OF THE D.D.S. FOR THE M.D.S. DEGREE.

The essayist reviewed briefly the history of the degree of Doctor of Dental Surgery, saying that its origin was coincident with a movement to elevate the dentist above the plane of the barbers and bloodletters, which resulted in the establishment of the first dental college, the Baltimore College of Dental Surgery, at Baltimore in 1839 by Dr. Harris, which proposed to give a special course of dental instruction. The necessity for a new degree was recognized and the degree of D.D.S. was established, and was conferred upon the first graduating class of the Baltimore College in 1841. Other dental colleges followed this one, and in the course of time the profession became firmly established.

The speaker further said that it was only natural that the profession should want to honor these men who had borne the brunt of the battle by conferring the degree honorarily upon them, but in every instance it met with opposition, and in 1884 the College Faculties Association passed a law that no college belonging to that association should confer the D.D.S. degree except upon those who had successfully passed through the regular prescribed course of study and examination. He called attention to the fact that several of the colleges had conferred this degree honorarily without the consent of the association, and that in every instance it had been recalled. He said that from the beginning the D.D.S. degree was intended to show that the men had followed the regular prescribed course of instruction and had successfully passed the examinations, and that every attempt to confer the degree honorarily had met with strong opposition.

In speaking of the M.D.S. degree, he said that in 1868 the state legislature passed a law allowing the board of regents to confer the degree of M.D.S. on practitioners who came before them and successfully passed an examination given by them. This was continued, he said, until 1895, when the law was repealed.

He then referred to the effort on the part of some of the men holding this M.D.S. degree to have it exchanged for the D.D.S. degree, offering as their reason for asking this exchange that it would retire the degree and make one uniform degree. With this end in view they had succeeded in having the legislature pass a law allowing the board of regents to grant this exchange. It was expected, he said, that the exchange would be made immediately, and one of the first men to apply for the transfer was a gentleman from New Jersey. Pressure was brought to bear on the regents, however, and a request was sent them from the Faculties Association asking that they decline to exercise this power. The regents decided to refer it back to the State Society for their approval, and in 1901 the society voted against it.

Most of the profession in the state thought this would be the last of it, but in May 1902 the men who were so anxious for this exchange had secured reinforcements and came to the society meeting to get the society to reconsider its action of a year previous and approve this exchange. A motion was made by one of the men to lay aside the regular order of business and take this matter up, the mover frankly acknowledging that men were there for that purpose and wanted it acted on at once. The subject was taken up and the law was indorsed by a vote of three to one. The speaker called attention to the fact that he protested against such action at the time, believing that it would not meet with the approval of the profession in general. He did not believe that a majority of the men holding the degree of M.D.S. would favor the exchange; that it would be a dangerous precedent, and would de-

tract honor from the men who held the degree of D.D.S. after following the prescribed course of study—a degree which was so highly prized by twenty thousand of the profession to-day.

He further said that only 160 men had received the M.D.S. degree, and of that number twenty-five were dead, thirty-five had retired from practice, about twenty-five held both degrees, and there were about twenty-three unplaceable, which simmered the matter down to about fifty-five who could ask this exchange, and of this number he did not believe that twenty-five would apply for an exchange. Regarding the contention that the main objects of the exchange were to retire the M.D.S. degree and to honor the older men of the profession, the speaker further said he was confident that the majority of those holding the M.D.S. degree considered it more of an honor than to hold the D.D.S. degree, and to take this degree away from them would be a dishonor. He could not but believe that the chief men who were fighting for this exchange had other motives than those stated above. There were men who wanted to stand on an equal footing with the men who had taken the regular college course, and virtually receive that credit which was not due them.

He believed that it was the duty of every man in the profession to uphold the honor of the degree, and to fight every effort toward conferring it as an honorary degree.

He then referred to the fact that so far the board of regents had declined to use the power given them, mainly through protests of individuals of the College Faculties Association and of all the leading magazines with one exception, and an effort was being made to have repealed the law granting the board of regents this power. He believed it was the duty of every member of the profession in the state of New York to aid in having this law repealed, for the good of the profession in the state as well as in the United States.

In closing, he said he simply wanted to call the attention of the profession to

this movement, so that when the question was brought up again before the society they would have some intelligent understanding of the subject and he urged that every man use his influence against this proposed exchange of degrees.

Discussion.

Dr. HUIVER, in discussing the question, said his reason for favoring the exchange was not to retire the degree, but it was his desire to honor these men who had done so much for the profession. He said the M.D.S. degree was the same as the D.D.S. so far as its value was concerned anywhere in the world, and he believed that if New York state saw fit to grant this exchange it was no concern to the outside world. He called attention to the fact that he held both degrees, and said that he had worked harder for the M.D.S. than he had for the D.D.S. He said there were many who wanted this exchange besides the few men who were the leaders of the movement. He knew many who wished it, and had done more for the profession than any who held the D.D.S. degree. He gave as an illustration Dr. Palmer, who, he said, had done more for the profession than ten thousand graduates. He thought these men should be honored, and if it would cause them any pleasure, and make them die happier for having the D.D.S. degree, he was in favor of conferring it upon them.

Dr. ESHLEMAN thought Dr. Huver was going almost too far when he said that if the state of New York wanted to confer this degree it was no concern of the outside world. He believed it was a matter that concerned the entire profession, and that it would be a dangerous step for the state of New York to take. He did not think it was looked upon as a question of whether they deserved it or not; it was that the D.D.S. degree represented the holder as having followed a certain prescribed college course, and he did not think men who had not followed the course deserved the title. The M.D.S. degree was conferred on these men on account of their successfully passing the examinations given by the

board of regents, and showed that they had not followed the regular course of college instruction.

Dr. MEISBURGER agreed with Dr. Eshleman that it should not be conferred on men who had not taken the regular course. He said there were some who deserved it, and some whom he would like very much to have it, but the difficulty was in drawing the line between the deserving and the undeserving. In conferring it upon all who hold the M.D.S. degree, he believed some would receive it who did not deserve it, and he opposed the exchange on that ground.

Dr. BUTLER called Dr. Huver's attention to the fact that the M.D.S. degree was absolutely worthless outside the state of New York, and if the D.D.S. degree was exchanged for it, it would be of value anywhere in the United States, and this, he said, was why some men were working for the exchange. He reviewed briefly the history of the M.D.S. degree, saying that it was practically the first step toward raising the educational requirements of the profession. The degree, he said, was very dear to the older men of the profession, and he believed it should not be retired on account of the good it had done for the profession.

Dr. FREEMAN said he was not at the last meeting of the State Society, and knew nothing of what was going to be brought up, but he believed a general sentiment, such as had been expressed by the previous speakers, was continually growing throughout the state, and in accord with this sentiment, he offered the following resolution:

WHEREAS, The law of this state relating to the practice of dentistry permits the board of regents to exchange the degree of Master of Dental Surgery (M.D.S.) as conferred during a term of years extending from 1869 to 1895 by the Dental Society of the State of New York, for that of Doctor of Dental Surgery (D.D.S.); therefore be it

Resolved, That we, the officers and members of the Seventh and Eighth District Dental Societies of the State of New York, in union convention assembled in Buffalo, October 28, 1902, after listening to the presentation of the facts in the case, and a full and free discussion of the situation in all its bearings, do respectfully request the board of regents to decline to take such action, believing it to

be detrimental to the best interests of the dental profession so to do.

Dr. STANTON seconded the resolution, and said he would like to hear from Dr. Line on the subject.

Dr. LINE thought that while there were men who wanted this exchange, he believed the majority of the men who hold the M.D.S. degree considered it more of an honor than the D.D.S. He said that, while he held both, if he only had the M.D.S. he would not exchange it for all the degrees in the world. He was heartily in accord with the sentiment of the resolution.

The resolution of Dr. Freeman was then submitted to a vote and carried.

Adjourned until 8 P.M.

FIRST DAY—*Evening Session.*

The meeting was called to order at 8 o'clock by the president.

Dr. F. J. CAPON, Toronto, then read a paper on "The Bicuspid in Porcelain," as follows:

THE BICUSPID IN PORCELAIN.

Mr. Chairman and Gentlemen,—In complying with your invitation to write a short paper on something practical, I have taken the "bicuspid" as one requiring our attention more frequently than any other tooth, and I think you will agree with me when I say that the bicuspid often tax both our ingenuity and our patience in filling or crowning them. When the large approximal contours—mesially, distally, or both—have been completed, one has a feeling of relief both mental and bodily. To our great surprise and disappointment, however, the bicuspid has returned and confronts us with a recurrence of caries at one of the obscure margins; or worse, the beautiful contour has been dislodged for want of tooth tissue for retention, to resist the strain of mastication; or even worse yet, the buccal or lingual surface, the only remaining portions of the tooth, has become severed, the fracture carrying to the wall of the alveolus.

These are conditions that confront us continually. Are we always able to

meet these contingencies in an artistic manner?

Statistics of the relative liability of teeth to decay give the honor position on the list to the first molars, next come the second molars, then the bicuspid, and so on, with the lower canines standing alone as sentinels in defiance of the bacterial army, which from time to time has attacked and demolished the remainder of the line that once stood shoulder to shoulder without fear of such insignificant intruders.

Although molars are the most prone to decay, they are of less trouble to us, as in the great majority of cases, when crowning is indicated, a gold cap will cover the broken-down tooth, and if properly done will give a satisfactory account of itself for the purpose the tooth is designed for as a masticator; but it is the limit line from an artistic standpoint, and even to this must exceptions be added; in the cases, viz, of vocalists, actresses, or ladies with expansive mouths who show their teeth from molar to molar. Porcelain is then indicated even in molars.

The exceptions are very few indeed where porcelain cannot be used on first and second bicuspid, upper or lower, in single crowns or as abutments to bridges. The exception I should make is in the case of a man with a heavy lip and mustache having a short, powerful bite, where heavy mastication is the main consideration. For ladies, where a fixed bridge is indicated and the bicuspid (the pier for the bridge) is intact, it is preferable, in my mind, to remove the pulp and utilize the canal for the dowel and spur attachment, as a means of preventing the conspicuous gold cap, the open-face cap, or the tearing-down of a good natural tooth—which, like "humpty dumpty," can never be replaced.

Every dentist must determine for himself when a tooth is ready or in a condition to require crowning. There is no fixed rule by which to determine the indication; it is of course left to the judgment of each operator. I must say that the judgment of some dentists is sadly wanting; their crowning efforts confront

us continually, not only in our offices but in the streets, filling us with mortification over such base methods. It is indeed lamentable that this most valuable method of crowning, with such great possibilities, should have been found of such abuse as to bring discredit upon the profession. It seems to me that there is no more excuse for disfiguring one of our patients, especially a lady, by placing gold caps on any of the ten anterior teeth than there would be for an oculist to replace a lost eyeball with a gold one, which would be neither artistic nor in harmony with nature.

The writer would suggest that a proper indication for a crown is when the walls of the tooth are so broken down that they give no retentive strength to filling material and no assurance of success to that mode of treatment; *i.e.* it has gone beyond repair. This might serve as a general definition, but there are exceptions where crowning is quite justifiable, as in cases of disfigurement from a black tooth; irregularity; extensive abrasion or erosion; badly pitted and peg-shaped teeth.

Now, there are certain requirements for all crowns—viz, strength, appearance, occlusion, approximal contour with contact, and withal a general fit. It is of course left to the decision of the operator as to what class of crown will fully meet these requirements. In the great majority of cases porcelain is able to fill the bill, but being a vitrified mass and therefore more or less friable according to bulk, there are cases of bicuspid which are presented for crowning that will severely tax the best judgment in order to get a satisfactory result.

A combination crown of porcelain and metal is more desirable esthetically than the all-gold cap; the latter may be used only where the more artistic crown has failure written upon it, in which case I presume a gold one would necessarily be chosen rather than the loss of the root.

In speaking to one not thoroughly acquainted with the uses and strength of porcelain, he is very apt to remark that "porcelain crowns are all right to look at, but one wants something to masticate

upon." In an article in the *Dental Review* for September 1898, Dr. Nyman of Chicago describes some experiments made by him as to the strength of porcelain which are positive as well as also interesting and astonishing. To quote:

In order to ascertain about what strain the average bicuspid and molar porcelain crown would withstand, the writer constructed what he thought was an average size crown of each of these, identical in every way with a crown that would be constructed for practical purposes. They were ground off flat on both top and bottom. The dimensions were as follows:

	<i>Bicuspid.</i>	<i>Molar.</i>
Top to bottom . . .	7 mm.	7 mm.
Mesio-distally	4 "	8 "
Bucco-lingually . . .	6 "	6 "

Justi's teeth as facings and Close's body were used. These were then tested at the Armour Institute of Technology in a standard testing machine (made by Riehle Bros., of Philadelphia) by E. C. Kerr, the professor of mechanical engineering, with the following results:

	<i>Bicuspid.</i>	<i>Molar.</i>
Cracked . . .	1,740 lbs.	2,230 lbs.
Crushed . . .	2,240 "	4,020 "

These results seem astonishing, and as the average crushing force of the human jaw is about 175 lbs., the writer believes that this demonstrates beyond a doubt that the average porcelain crowns have strength sufficient to withstand any pressure that may be brought to bear upon them in mastication.

The condition of the root as the foundation for the proposed crown is the first consideration, and, as I have already said, often requires rare judgment to determine upon a plan. Various conditions may be enumerated as follows:

(1) A typical bicuspid root in healthy condition with coronal portion broken down, pulp extirpated, bite normal and of sufficient length for porcelain.

(2) Same conditions as (1), but bite close and the use of porcelain doubtful.

(3) Fractured root, caused by the parting of either of the buccal or lingual walls of tooth, severing deeply under the gum margin, beyond reach of a banded crown.

(4) Root badly decayed below the gum margin with frail cementum walls.

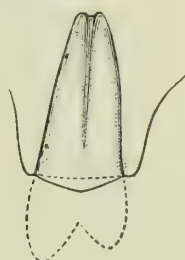
(5) Root in better condition than the last mentioned, but not enough pro-

jecting root margin for banded crown, yet strong enough to support a crown.

CONDITION No. I.

The first consideration is the mechanical preparation, which for any crown is a most important step and possibly determines between success and failure in the operation; its importance, however, has been so strictly dealt with by teachers that one can pass on. We will suppose, then, that the enamel edges have been cleaved and the root trimmed to at least the gum margin buccally, or perhaps slightly below. If occlusion space is a consideration, the palatal portion may also be trimmed to the gum edge following the festoon of the gum for the remaining surface of the root, having sufficient root for banding so that it will not impinge upon the pericemental membrane. It is a frequent practice to cut the root down considerably lower at the septum, especially if the bite is short, so that a greater body of porcelain may be got on the crown for strength. (Fig. 1.) By so doing it will cause irritation

FIG. 1.



to the peridental membrane, with a lameness and a falling of the septum in the interdental space; it will have lost its natural surroundings, which cannot be brought back by any artificial means. If the bite will permit it, a projection of the palatal portion above the gum margin is an advantage for strength and retention. (Fig. 2.)

Condition No. 1 gives us an indication for almost any porcelain crown with a fair chance of success, but as a bicuspid (premolar) has a large part to play in mastication, having an occlusion surface with a vertical stress, and cusps which give it a lateral stress in two directions, it is well then to have a band to accom-

pany the crown, as the chances of fracture or dislodgment by the lateral pressures are materially lessened.

For some years the writer has confined

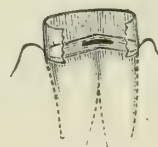
FIG. 2.



himself to an original crown (already in print—see *Cosmos* for February 1902), believing it to be strong, which is an all-important consideration, for, no matter how beautiful a crown may be, if it is not strong enough to perform its duty it is worse than useless, as it will be sure to come back to you with the double responsibility of removing the fractured portion, which at times is by no means an easy matter.

The crown in detail. Having taken the size of the end of the root, a band of platinum (which for porcelain should have a lap or covered joint) is made with plenty of width to accurately fit the root, festooning for the septum; the band should be wide enough so that when it has taken up its proper depth in the free margin the remaining width will stand well above the face of the root. While the band is in position on the root, with a sharp-pointed instrument scratch on the inside of the band the line of the root, also on the outside of the band mark the buccal festoon of the gum line (Fig. 3).

FIG. 3.



Now with a pair of fine-pointed scissors cut out the buccal half of the band

FIG. 4.



to the marked gum line (Fig. 4), and, if the root will allow it, file a little below

it; place the band on a piece of platinum sheet, No. 30, mark the shape of the band upon it for the palatal two-thirds (Fig. 5), trim with scissors and file ac-

FIG. 5.



curately to the mark, and fit it to the line on the inside of the band. It is now tacked to position with pure gold or platinum solder, after which that part of the apron remaining may be pressed down to the buccal portion of the band and the solder complete its course around the band (Fig. 6). Trim off any sur-

FIG. 6.



plus and file the buccal edge rounding, which allows of a better and stronger extension of porcelain on the band. The pulp-canal is now made ready to receive a square iridio-platinum dowel; a small hole is made in the floor of the cap opposite the canal and the dowel forced home through the hole with the cap in position on the root. The band and dowel are carefully removed together and soldered in their proper relation. The extended portion of the band can now be given the approximal contour with contact to the adjoining teeth, which with porcelain is just as essential for the protection of the septum of gum in the inter-approximal space as for any other work. The shade, bite, and impression in plaster is taken, if the crown is to be completed in the laboratory. It is well in the meantime to cover the root with temporary stopping to keep the gum from creeping over the edge of the root. The selected facing is ground in position; it is then invested and the pins of the facing soldered to the dowel or to the floor of the cap (Fig. 7). All excess of pins or dowel head should be removed and the remaining parts nicely rounded; the bulk of body is preferable to the platinum ends, which invite fracture to

that portion of the crown which is weakest.

The framework of the crown is now ready to receive the body, proceeding along the lines of any porcelain crown.

The portion of the band projecting above the face of the root, forms a "cup" in which the porcelain has its base and

FIG. 7.



gives to it the additional strength required for mastication, so that the liability of fracture of the porcelain is reduced to a minimum. The facings of these crowns give little or no cause for anxiety, as they are made with "block" body, the entire surface of which is etched to the body of the crown. It is soldered as well. This "cup crown" in porcelain can be used to serve as abutments of gold bridges, as solder can find ample surface of attachment on the mesial, distal and palatal surfaces.

CONDITION No. II—*Root in same condition as No. I, but bite close; use of porcelain doubtful.*

I have already said that bicuspid and molars require a crown that will withstand the force of mastication. The former in my experience are the most difficult to contend with, and more especially when the bite is short with the lower cusp occluding in a deep sulcus. (Fig. 8.) As a rule this condition gives but slight indication for an all-porcelain crown, especially if the retention is wholly dependent on a dowel which greatly weakens the already weak portion of the crown. The natural bicuspid is prone to fracture more than any other tooth by reason of a deep sulcus and often a close occluding and interlocking cusp of the lower tooth; add to this that the main portion of the tooth has been taken away and probably replaced by a filling that makes, sooner or later, frac-

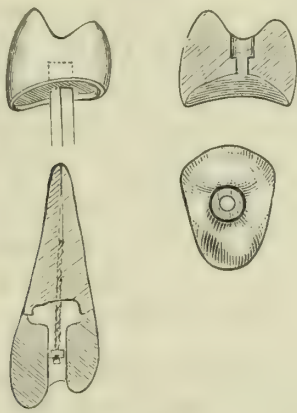
ture of the buccal or lingual wall almost a certainty (Fig. 8, A and B), which may prove serious, if it were severed below the alveolus.

FIG. 8.



All the manufactured (ready-made) crowns for bicuspid either have a dowel-head or a hole, which is placed in the center, the weakest part of the crown,

FIG. 9.



rendering them almost out of the question for this particular condition. (Fig. 9.) This cup crown which I have suggested can be made with or without a dowel. It comes to our aid in just these cases.

CONDITION No. III—Fractured root caused by the parting of either the buccal or lingual walls of the tooth, severing under the gum margin beyond reach of banded crown.

To curtail the time I will combine conditions Nos. III and IV into one, as the procedure in root-restoration for a foundation is similar.

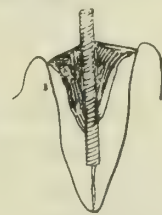
CONDITION No. IV—Root badly decayed below gum margin, with frail cementum walls.

In those roots where there has been such extensive loss of tooth-substance

that hypertrophied gum overhangs and possibly fills the root, one may grasp at the remains to build on a crown for esthetic effect alone. In these cases the root form is to be restored sufficiently to furnish a good base. It is generally necessary to cut out the fungus growth; maybe better results are got by the electro-dental cautery, being able to proceed at once, otherwise the gum must be pressed back with temporary stopping, to free the root edge from the overlying gum. The next step is to bring the root from the pathological condition to that of health.

It is very necessary to restore the root form by means of a rigid and insoluble material; good amalgam is best adapted for this purpose, and should be used with the same care that is required to make a good filling. If the edges are accessible, the root is dried, the canals cleared and tapped for the reception of a gold screw-post; after placing a small portion of cement on its extremity, it is screwed into the canal. The root is given an undercut, if possible, to aid in retaining the amalgam, which is packed about the post over the face of the root to the gum margin, or even higher, as the case demands. (Fig. 10.) If the

FIG. 10.

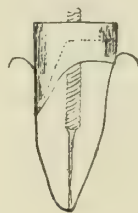


root is fractured or decayed considerably below, then a matrix with an apron to take in the extent of the fracture is required, into which the amalgam can be packed.

In restoring a bicuspid root on which a collar-crown is to be placed, the matrix is made deep enough to grasp the end of the root as firmly as possible, and to extend about one-eighth of an inch above the margin of the gum. (Fig. 11.) After a few hours the matrix can be removed and Rhein files passed down under the gum to remove any rough edges of amalgam. In any case the external edge

of amalgam can be ground to suit the kind of crown desired. There is no crown, to my knowledge, better suited to such a foundation than the one men-

FIG. 11.



tioned for the other conditions, but of course no dowel could be used; perhaps a modification of one could be applied, if one thought the retention insufficient by band only. By trephining the amalgam from around the screw-post, a tube is fitted over the post and pushed through

FIG. 12.



the floor of the cap and soldered, the free end of the tube is pinched together, and the pins of the facing soldered to it. (Fig. 12.)

CONDITION No. V—*Root in better condition than the last mentioned, but not enough projecting edges for a banded crown, but still strong enough to support a crown.*

This condition, with its concaved root-face, gives as a rule ample room for a mass of body which will be sufficiently strong for the occlusion that one would give to a root of this caliber. In all possibility it would be a crown for appearances; in such a case I would hardly define the palatal cusp, to lessen the liability of breakage or dislodgment. The more accurately this class of crown fits the face of the root the greater chance of success. Then I would proceed by burnishing a piece of platinum No. 35 to fit the face of the root. One can often

obtain an approximate shaping by using a small piece of compound on the end of a pine stick, heat over a flame and take the impression of the end of the root, and by pressure first, and then by gentle tapping with a hammer on the end of the stick, the compound will have forced the platinum nicely into position. Now remove, and having fitted the post, marking upon it the length it went into the canal, push it through the disk and sol-

FIG. 13.



der. The disk and post are placed back onto the root and burnished closely, and with fine-nosed pliers a slight band can be turned on it that will help to retain and protect cements. The remainder proceeds as for any porcelain crown. (Fig. 13.)

Discussion.

Dr. M. L. FAY, Buffalo, suggested that instead of trephining around the pin as Dr. Capon spoke of, he used the tube in building up the root, and that by allowing the pin to pass into this and through the collar of the crown better anchorage could be gained. He simply reverses the essayist's method.

Dr. PROSEUS, Rochester, thought that in building up these bicuspid teeth with porcelain the ordinary plate tooth would be stronger than the facing. With regard to Dr. Fay's suggestion of using the tube in the root, he thought there were but few cases in which the root would warrant this, as it would weaken the root were the tube allowed to extend far enough to give the necessary strength. His method in these cases was to drill two canals into the amalgam and fit small iridio-platinum pins into these canals and attach them to the collar. He thought this would be stronger.

Dr. HOWARD. I would like to ask the

doctor his method of holding back the gums in building up this class of teeth.

Dr. COLLINS. I would like to ask the essayist about the time it takes to build up a tooth like this and place a crown such as he describes. The question of time is an important one with the class of practice that I have.

Dr. PEARSON, Toronto. It is often the case that practitioners have to consider the fee in undertaking work, and I would advise those who do not intend to do a great deal of work for the sake of the work and not for the fee, to let porcelain work alone. It takes a long time to learn this work, and after you have learned it it takes a long time to perform a good operation with it. I wish to compliment the essayist on his paper, and especially on the character of his drawings. The paper is illustrated just as I think a paper should be. There is one point I would like to ask about, as to the practice of cutting off the pins of the facing instead of soldering them to the cap of the crown or to the dowel, simply filling the cap with porcelain body and attaching the facing with the porcelain. While it is true that you get rid of the body of metal there, still it seems to me that if the pins were soldered to the floor of the cap or to the dowel, there would be greater strength from having the two attached, and I would like to ask what advantage he claims for this procedure.

Dr. STANTON, Buffalo. I wish I could live to see the day when I would not hear the question of money received for an operation spoken of among dentists. I have been living in this city for thirty years and I have seen some of the best surgeons in the city stand and work for hours on cases when they knew they would get nothing out of them. They did it for the sake of science, and to gain the highest possible degree of perfection in their work. I have worked for hours myself when I expected to get nothing for the work. I want the day to come when the question of pay will not be brought up in the societies. I presume that Dr. Capon does a great deal of work and spends many hours on work that he does not get any money for, and that is

what is making him one of the leading men of the profession to-day.

Dr. Low, Buffalo. I would like to ask a question with regard to a couple of crowns that I have seen in porcelain. The body of the crown was porcelain, but the metal was of about the color of gray gutta-percha. I want to know what kind of metal it was. It gave a better appearance than either gold or platinum.

Dr. CAPON. I am somewhat disappointed that the paper has not caused more discussion. I like to hear a paper discussed; it usually brings out valuable points. With regard to Dr. Fay's question of putting in the tube instead of a post, I will say that I use the post to give the necessary strength and to help retain the amalgam. In using the tube it does not afford retention for the amalgam, and besides, it will weaken the root of the tooth, while the main idea in crowns of this character is to work for the necessary strength. Where I use the screw I put on four or five threads, and can get a hold on the root, and it helps to retain the amalgam. Besides, if the occasion to repair this comes, you have double trouble with the tube.

With regard to Dr. Low's question of the metal used in a porcelain crown he saw, I will say that if the crown was of porcelain, it was platinum that was used, as that is the only metal that will stand the heat of the furnace in fusing the porcelain.

Dr. Howard asked how the gum is pushed away in building up these roots. I use the cautery, and if the gum extends over a great deal, I use the lancet to cut it away. I then use a piece of gutta-percha held in with a small piece of wood to keep the field clear. I never leave a root without putting something over it. I either do this or put on a Bonwill crown with temporary stopping to be worn while I am making the crown, and this prevents the tissues from coming over the root.

I would like to commend Dr. Ballachey's paper with regard to gold crowns. It was excellent and on the right line. Not long ago a lady came into my office with a gold crown on one of her

bicuspid teeth. I said to her, "I cannot let you wear that gold crown." She said it had only been on for a year or two, but I told her it must come off. I told her she could not be my patient and wear a gold cap in the front of her mouth. I took off the cap and I found there a tooth that had been mutilated to put on a miserable gold cap, and it had only two small cavities in it. I filled the cavities and shaped the tooth up the best I could and did not crown it. The lady shocked me very much when she asked what the dentist did that for, because I had to tell her that it must have been for the money he got out of it. I did not like to say that about any man, but a man who would do such work as that is not my friend. Such practice is deplorable; it is criminal.

One of the gentlemen asked me about the strength of a porcelain crown, and the time necessary to make it. I will not discuss the question of time, as Dr. Stainton has covered that ground very nicely. With regard to the strength of the crown, there are cases where beauty has to be sacrificed for strength. Last week I had an accident to a porcelain crown on a central incisor—by the way, one of the largest teeth that I ever saw—and the bite was so close that I could not get enough body to the crown on the lingual surface, and as a result it fractured. I had to remove the crown and put on one of my strongest gold cap crowns. This is an exceptional case, and there are cases, as I said, where beauty has to be sacrificed for strength, but in the majority of cases the porcelain will give the desired strength. I refer you to the tests made of porcelain, as quoted in my paper, where it took 1000 lbs. pressure to crack the porcelain.

Dr. PEARSON. How was that porcelain put on? Was it under pressure?

Dr. CAPON. I have not made any experiments along the line of putting the porcelain on under pressure, and besides, that is not practical as with the present methods—we should require a die for every tooth, but I do not think it makes such a great difference in the strength of the porcelain.

Dr. PEARSON. What I want to get at is, do you think that for all practical purposes putting the porcelain on with the brush is all that is necessary?

Dr. CAPON. In putting the porcelain on with the brush and tapping it so as to settle the porcelain, I think you can get the body about as close as with pressure.

The doctor asked me why I did not solder the pins to the cap or to the dowel. My main reason for that is that in building up a bicuspid crown it cannot be handled as well when the pins are soldered as when they are not. As to the question of strength, I think it is just as strong on account of the method of fusing. When the proper body is used, and carried to the proper temperature, it is practically fused to the facing and is solid, and I believe you have it just as strong as when the metals are soldered together.

Dr. FAY. Do you think the tooth is any stronger when the body is put in under pressure than without pressure?

Dr. CAPON. Yes; for the reason that with pressure you can get more body in the same space.

Dr. Stainton made a few remarks with regard to fees, and in this connection I would like to say that I will never forget a reprimand that I got from Dr. Kirk of Philadelphia on this subject. In discussing a paper that I had presented before a society, he said he was much pleased with the paper, but was very much surprised that an essayist with so many artistic ideas would be guilty of mentioning that money should be taken into consideration. I have never mentioned it since.

On motion the subject was passed.

Dr. CHAS. E. PEARSON, Toronto, read a paper on "Building of Contour Amalgam Fillings in Molars." (This paper was printed in *Cosmos* for December 1902, page 1238.)

Discussion.

Dr. BUTLER. I find it very difficult to discuss a paper that so nearly coincides with my views on this subject as expressed to many members of the so-

ciety. We have had three papers to-day in a measure bearing on this one line of thought, and it is to me the sign of a revolution in the profession against the use of gold caps—a time that I have anticipated with the greatest pleasure. It would take a very strong man to get up and advocate the use of gold caps after the three papers we have had. This afternoon the essayist showed the lack of necessity of gold caps on the centrals and laterals; then Dr. Capon has taken the bicuspid out of the category, and now Dr. Pearson has shown very forcibly that these broken-down molars built up with amalgam are better than gold caps. We have all seen the use of gold caps in various places in the mouth too much abused, and it is time for the profession to rebel against such work. It has been demonstrated beyond doubt that the advanced methods of replacing these teeth are more beneficial and satisfactory, as well as more artistic, than anything we can get with gold caps. I think we all feel a debt of gratitude to the essayist for presenting a subject that should be of such vital interest to the profession.

Dr. MEISBURGER. I do not know how strong a man Dr. Butler had reference to, but I have the nerve to say a word in favor of the gold crown. I claim that there is a place for the gold crown. I think if more of us would have the nerve to get up and say something on every subject and not always agree with the essayist we would learn more. Now, in the discussion following I would like for each man who gets up to discuss the paper to say how many of these large contour amalgam fillings he has seen that have given good service for many years; how many he has seen in which you could not pass the explorer under the edges. This is very beautiful specimen work that the essayist has passed around, and I do not doubt that he can do it just as well in the mouth, but I think in many of these cases we can do more good with a crown. Some claim that a gold crown is a very easy thing to make. That is a mistake. A gold crown properly made and fitted to the tooth is not an easy matter, and I claim that a

gold crown, properly made and fitted, is better than anything we can do with amalgam. Dr. Capon is doing some very pretty and serviceable work in his line. It is difficult to do and requires constant application, and I do not wish to discredit any of his work, but many of us can get as good results from other lines of work. I do not advocate the use of gold crowns unless there is a necessity for it. We all realize that the value of the crown lies in the proper fitting around the tooth underneath the gum, and this same thought holds good with the crown that Dr. Capon has shown us. I do not place gold crowns in front of the first molar, but I do claim that when the gold crown is properly made and fitted, it will do just as good service as any other method advocated.

Dr. MIMMACK. I have followed about the same line as Dr. Pearson has advocated in his paper, and cannot say that I have had any failures from the work. I cannot see that the amalgam will irritate the gum if it be properly finished. I make a matrix for the tooth and leave it on until the amalgam is set, then take it off, and finish around the gum line. I leave the edges so smooth that an instrument will not catch on the edge, and there can be no such thing as irritation there. I am rarely called upon to put on gold crowns, and seldom use them excepting as abutments for bridges.

Dr. CAPON. I am one of those who do almost anything. I use gold caps, make amalgam fillings, etc. I think there is a place for everything. The object of my paper was to show the advantage of the porcelain crown under certain conditions. Dr. Pearson goes a step farther than I did. He takes an old root that is practically unfit for a crown, and builds it up with amalgam. In building up these teeth with amalgam, however, I think a crown over them will make them more substantial, as it acts in the same way as the hoop around the barrel. I think if there could be certain rules established along definite lines, and followed out by the profession, as to when a tooth should be crowned, there would be fewer of these gold caps put on.

Dr. BUTLER. The objection raised by some to putting the gold cap over the amalgam filling is the color.

Dr. CAPON. A well fitting gold cap on the upper first molar is to my mind preferable to a large contour amalgam filling that will turn black; and besides, you have the advantage of the extra strength to the tooth.

Dr. MADDEN. With regard to the question of crown work, Dr. Goslee is publishing a serial article on the method of making and fitting crowns—how to trim them around the root, and to fit the crown to the root—and I think it would be well for any man to study his methods, and if he will follow that practice he will not have much trouble in crown work. The question seems to resolve itself into the question of tooth-formation and the fit of the crown. If the crown is fitted properly, I cannot see any reason why there should be any irritation of the peridental membrane. In regard to building up teeth with amalgam, I have been fortunate in seeing the results of a good many years of this practice in my association with Dr. Selvy, a man who had a wonderful ability in shaping cavities and building up contour work. I have seen many teeth that looked hopeless, yet he would take them and build up a crown with amalgam and they would stand for years. I think all the different methods mentioned here have certain advantages, and I do not think any man should condemn another's practice when he has not thoroughly tested the method.

Dr. STANTON. I would like to reiterate what I said this afternoon on this subject. These crowns built up with amalgam are very beautiful, but it is very difficult indeed to do this kind of work in the mouth. When you have finished one of these large contour fillings you have a margin of about an inch and a half near the gum margin that is very susceptible to a recurrence of decay, and I claim that if you will put a well fitting cap over this you will have something more substantial.

Dr. Low. These porcelain crowns as demonstrated by Dr. Capon are very

beautiful, but I claim for the molar teeth that a gold shell is more serviceable and will be the best for the patient, and is much stronger.

Dr. PEARSON. I am very much pleased with the discussion. My object in presenting the paper was to get the sentiment of the profession on this method of work. A paper was presented before our society at Toronto, entitled "When Should a Molar and Bicuspide be Crowned?" and in the discussion it was advanced, as it has been here to-night, that after a molar tooth had been built up with amalgam, for it to be covered over with a gold cap was about the best method of procedure. I came to the conclusion that if the roots of a broken-down tooth were to be built up with amalgam and crowned, it would be just as well to make the crown complete with amalgam. If, to put the crown on, you have to restore the tooth with amalgam first, then there is no reason why it should not be built up altogether with amalgam; I do not believe that a crown will add anything to that. I have taken very extreme cases in which to demonstrate my method. I have taken a case and built from below the gum margin; and I do not believe that a case like that can be benefited except in appearance. Of course the amalgam used must have the necessary edge strength. In cases where there are no walls left to the tooth, there is no difficulty in putting the amalgam on with a matrix. Now, if this be done properly, I cannot see the use of putting a gold crown over it.

Dr. STANTON. It is done to get rid of the margins of the cavity.

Dr. PEARSON. I am willing to admit that the gold crown has its place. I do not wish to be understood as advocating that a gold crown should not be put on at all. I have attempted to show that the tooth built up entirely with amalgam is as good as the crown, and in many cases better.

Dr. STANTON. You say it is better than a gold crown?

Dr. PEARSON. Yes; I believe the margins can be left smoother than in a gold crown, and I think I leave them that way.

Dr. FAY. Do you always expect a good contour like the specimens?

Dr. PEARSON. When I can get the proper space I do. You must have space to do this work so as not to impinge upon the gum around the margins and so prevent it from creeping up around the neck of the tooth for its protection. I think you will all agree that this very frequently takes place.

On motion the subject was passed, and the meeting adjourned to meet again on Thursday afternoon.

CLINICS.

Thursday morning was devoted to the following clinics:

Dr. H. A. PULLEN, Buffalo, gave a clinic on the treatment of a case of unilateral distal occlusion, illustrating with models, appliances, face-masks, and photographs. The operation as performed by him showed a very beautiful change in the facial lines of the patient. One unique feature of the case was the combination of appliances used—fixed appliances for performing the operation, and removable retaining appliances.

Dr. RICHARD KESSEL, Buffalo, gave a very interesting clinic on some of the uses of the Lauderdale crown and bridge outfit. The outfit consists of a swaging device and a tooth-cusp form die plate. The die plate has a very nice selection of cusps, and differs from other systems from the fact that the cusps are raised. A sealing-wax impression is taken from the cusp selected, and the gold is swaged in the sealing-wax impression. This impression can be changed, carving the cusp deeper or making the whole circumference larger, by cutting with a pocket-knife. The swaging device is used for (1) backing porcelain teeth; (2) making gold dummies for bridges or for rubber plates. This is done by selecting the rubber plate tooth to be reproduced, and investing the same with the pins down into the sealing-wax; then swaging gold over the tooth, which will stand the pressure of hammering. (3) For the purpose of constructing one-

piece bicuspid and molar crowns for normal teeth which are to be used as bridge attachments, or for regulating appliances. (4) For making open-faced crowns that fit perfectly. (5) To make a correctly articulating crown at one sitting.

Dr. F. J. CAPON, Toronto, had a patient in whose mouth he prepared an upper first bicuspid for one of his original porcelain cup crowns, as detailed in his paper. He made a platinum band, placed the floor in it, and then, after adjusting, placed the dowel and soldered, the result being a beautifully fitting foundation, upon which he fitted and placed a facing and supplied the remainder with porcelain body. Two bakings completed the work, which was a perfectly shaped bicuspid, strong and natural in appearance. He also prepared in the same mouth a badly broken-down lateral root which was restored to form by amalgam, having the screw-post projecting. He made one of his porcelain tube crowns for this case.

Dr. E. W. BRIDGEMAN, Buffalo, demonstrated his method of reinforcing partial dentures and removable pieces with half-round clasp wire, the point of such reinforcement being that of obtaining the greatest amount of rigidity in the smallest possible space. Briefly outlined, the method is as follows: Draw with a pencil an outline of the piece to be made, then score the model directly on the pencil mark with a shallow groove. Make a zinc die from the model and swage 18-k. No. 30 gauge B. & S. so as to slightly overlap the grooved portion—or, in other words, make this base-plate a little larger than the outline on the cast. To reinforce this thin plate, use half-round clasp wire No. 15 gauge, roughly adapted to the model with clasp benders; tack it with solder, and swage. Proceed as above with other wires, following out the line of the first one so that they will lie closely one to another, tacking each one as the work proceeds and swaging the whole when the wires are in place. The plate will now have a ribbed appearance, which, if skillfully carried out and the

wires brought into close contact with each other, will have a very pleasing appearance. The piece can now be invested and fully soldered; either flushed with solder so as to finish smoothly, or the wires merely soldered to the plate, leaving the ribbed appearance, which, in the finished piece, will look very artistic, if properly finished.

In small pieces for removable bridges the work may be done entirely on the plaster cast—preferably one hardened with stearin. In this case thinner plate of a higher karat should be used, so that it may be burnished to position. The wire or wires can be bent to place correctly if care is taken.

Partial lower dentures supplying the bicuspid and molars demand a connecting bar back of the anterior teeth. This, when made of rubber, as it usually is, is either bulky or weak, but a light strong bar, giving less annoyance to the patient, may be made by the above method with very little additional expense, which expense will be fully compensated for by the bar's beautiful appearance.

Dr. G. B. SNOW, Buffalo, exhibited a case of a foot-ball player who had the misfortune to suffer a fracture of the mandible. The fracture was between the right canine and the lower lateral incisor. There was but little laceration or displacement, and the case was one which had given but little trouble. The splint used was of the Kingsley pattern, but instead of a bandage for applying counter-pressure the operator used a chin-piece swaged of sheet brass, and a screw bolt on either side, passing into swivels on the lateral wires of the splint and hooking to a cross wire soldered on the lower side of the chin-piece. There were no complications in the case and union was secured promptly. There was no contusion or laceration and the splint was applied as soon after the fracture occurred as it could be made. He believed the bolts to be better than a bandage as there was no slipping, and if it is necessary to either increase or diminish the pressure of the splint, all that is required is to turn the nuts on the bolts.

SECOND DAY—Afternoon Session.

The meeting was called to order at 2 o'clock by the president, and Dr. J. WRIGHT BEACH, Buffalo, N. Y., read a paper on "Treatment of Devitalized Teeth." (For this paper see December 1902 Cosmos, page 1242.)

Discussion.

Dr. S. ESHLEMAN, Buffalo. I do not agree with the essayist in regard to his method of procedure in treating extirpated pulps. I do not see any reason why we should not arrest the hemorrhage where there is no congestion. My experience has not been that we get irritation in reducing hemorrhages of this character. I think we often get irritation from the excessive treatment by different antiseptics interfering with the resorption, but with the styptics we have at the present time I see no reason why the hemorrhage should not be reduced immediately. I have found adrenalin chlorid the agent that gives greatest satisfaction in these cases. Another reason why a styptic in freshly devitalized teeth will not irritate the tissues is because the dental tubuli are closed with small fibrillæ and there is no chance for the agent to pass through and irritate the surrounding tissues.

Now, I agree with the essayist in his objection to essential oils in the anterior teeth, as they always discolor them. Oil of cassia, especially, will give that yellowish cast to anterior teeth. I think the best method of treatment of freshly extirpated pulps in the anterior teeth is with hydrogen dioxid. All that is called for after the hemorrhage is arrested is to place the pulp-chamber in an antiseptic condition, and hydrogen dioxid will do that. I also use carbolic acid for such work. I think the doctor's ideas are sound in regard to the extensive opening into pulp-chambers. It does not require such a large opening to get into the chamber. For myself, I cannot recommend the use of pulp-canal reamers, for their disadvantages are greater than their advantages; I have seen so many teeth lost from reamers being broken off in them. I only use them to enlarge the openings of pulp-canals.

Since we have agents that are very effective in opening the canals, I cannot see any reason for the use of reamers. The doctor speaks of drying root-canals. Now, I do not agree with him in this, as I like hot air for this purpose. In treating putrescent pulp-canals I use hydrogen dioxid to sterilize the canals, and I like to dry out all the moisture possible so that they will be in condition to take up the antiseptic agent. If the dental tubuli are thoroughly dried out they will readily take up the medicament. I do not believe in getting the tissues so hot that it will injure them, but when you want to fill the canal with gutta-percha I think it is absolutely necessary that the canals should be thoroughly dried. Water will not unite with chloroform, and it is very troublesome to fill root-canals where they are moist. And in speaking of agents for filling root-canals, I think gutta-percha is so far the best agent used, and for this reason: We should never fill a root-canal with something that cannot be removed, because a certain percentage of the teeth we treat have to be re-treated, and I do not believe in filling the canals with zinc chlorid. With regard to sulfuric acid, will say that I have found it a very useful addition to our medicaments for treating teeth.

Dr. MEISBURGER. I cannot see why so much stress is laid on the danger of forcing hydrogen dioxid through the root. Any other medicament will produce about the same result if forced through the root, and I do not see any reason why a careful operator should force this agent through the root-canal into the tissues.

Dr. W. C. HAYES, Buffalo. I find that in treating root-canals a very good method in filling them is to saturate the canal with chloroform, taking a gutta-percha point and placing it in the root. The chloroform will dissolve the point, and I believe in this way I can fill the apex of the root more perfectly than with chloro-percha. I do not believe that it is possible to introduce chloro-percha well into the apex of the root without at times having air-bubbles there, which you

do not get if the chloroform is placed in the canal first. I have followed this method in a great many cases and I believe it gives a more perfect filling than the chloro-percha. With regard to the use of hydrogen dioxid, if it be forced through the root of the tooth it will produce a more serious condition than any other drug, on account of the pressure it creates.

Dr. MADDEN. With regard to the doctor's method of sealing the cavity with gutta-percha, I use oxyphosphate for this purpose for the reason that in sealing the cavity with this there is no danger of pressure. There may be a little moisture there, and possibly the gutta-percha would not go forward and seal the cavity as well as oxyphosphate without pressure. With regard to Dr. Eshleman's theory of trouble in after years being possibly due to material being left in the dental tubuli: If such is the case, then I feel that the material which would be best adapted for that use would have to have the properties that would enable it to stand there and keep the parts in an antiseptic condition. I think we have this property in zinc chlorid. It is hygroscopic and will absorb the moisture, and it will have the effect of protecting the tissue in the dental tubuli.

Dr. H. L. BELCHER, Buffalo. In regard to the properties a medicament should have that is used for filling root-canals, I think zinc oxychlorid has many of these properties, but, if forced through the apical foramen, it is especially irritating on account of a chemical action that takes place in the cement, and it is hard to remove in case of subsequent trouble. For that reason I use chloroform in combination with gutta-percha points. In his paper the essayist spoke of the necessity of having full view of the pulp-chamber. I would like to say "Amen" to this. No attempt should be made to fill the tortuous canals in molars without full view of the chamber. I say, open it up well and get thorough access. You must get these canals clean, and they must be thoroughly opened to treat them properly.

One other point, in regard to the use

of sulfuric acid. I use this in cleaning the canals and follow it with soda bicarbonate, allowing the latter to go just as far as the sulfuric acid has gone. With regard to the use of hot air, there is one point that I think in the past we have failed to realize fully, and that is the application of the rubber dam in getting desiccation by the use of hot air. By the use of the rubber dam you can use it much hotter than you can without. I do not favor the use of hot instruments for drying the canals; I believe it injures the dentin. Dr. Beach spoke of the use of eucalyptus oil in the canal before filling with gutta-percha. I have never used it, but I think it is a very good suggestion.

Dr. S. E. MACDOUGALL, Buffalo. In cases where a tooth is badly broken down, and I want to devitalize the pulp, I use zinc oxyphosphate to hold the preparation, and where I think there is any danger of getting pressure I use small concave metal caps over the pulp, and in that way avoid any pressure. I think oxyphosphate as a dressing is much safer and nicer than cotton or gutta-percha. With regard to the use of sulfuric acid, I must say that I am conservative in its use. I have not used it for some time, and I believe it is a mistake to use it as it is often used. I believe that it renders the tooth friable.

Dr. J. P. COLLINS, Buffalo. I believe that more failures occur from too small openings into the pulp-chamber than the essayist speaks of than from too large ones. It has been my practice for years to drill into molars until I can get free access to the anterior roots. In lower molars, especially where the tooth has deep walls, I would not attempt to fill the canals without free access. In so many cases of after trouble from filling the canals I have been convinced that it was on account of not having sufficiently large openings into these root-canals. Another thing, I use Gates-Glidden drills where I can. I excavate until I can get into these canals, and with a small drill of the proper size, being careful to follow the direction of the canal, I drill it out just as far as I can go, and then with a

small broach I go still farther if necessary. I believe in the use of sulfuric acid. So far as I am concerned, I believe that after thorough use of it we do not have much need for any other disinfectant. In the filling of the canal I use the chloro-percha and the gutta-percha points, but I would like to lay stress on the necessity of cutting back the enamel and dentin so as to be able to get into these canals easily.

On motion the subject was passed.

Dr. H. R. ABBOTT, London, Ont., read a paper on "Narcotile for Extraction." After reading his paper Dr. Abbott offered to give a demonstration of the manner in which "narcotile" was used to anesthetize patients, and Dr. Huver consented to be anesthetized. After the demonstration Dr. Huver was asked to give his opinion of the anesthetic, and to describe his feelings while under it.

Discussion.

Dr. HUVER said he thought that narcotile was a very dangerous drug, and should be used with care. He said he thought it was really more dangerous than chloroform, and that in administering it every precaution should be taken that is used in administering a general anesthetic. He said he thought the danger of it was in the fact that it contained ethyl chlorid. He had used ethyl chlorid in the past, but he had discarded it on account of its danger.

Dr. WETTLAUER said he did not see how Dr. Huver could get up and condemn this drug, not knowing what it contained. He said he was much interested in the paper and the demonstration, and from what Dr. Abbott had said of it thought it would be a good thing for the profession, and he wanted to know more about it. He said the fact that its bad effects had been seen in one case out of ten thousand, and then had produced only momentary locomotor ataxia, showed that it was a valuable drug, and he did not think that Dr. Huver should condemn it on such short notice.

Dr. ABBOTT, in closing the discussion, said he had been using this agent for some time, and it had proved of great

advantage to him in minor operations. He thought it the best drug on the market at the present time for such cases. He did not claim anything for the drug, but only gave the statements of the manufacturer for what they were worth. He said he never administered it without having in readiness a hypodermic syringe charged with strychnin, and in the few cases where he had had the bad after-effects of the drug, they were readily overcome by administering the strychnin.

On motion the subject was passed, and Dr. A. E. PRESTON, Delevan, N. Y., read a paper on "Late Comers." (See COSMOS, February issue, page 114.)

Discussion.

Dr. MADDEN said that the possible solution of the question of some of the late comers was in the fact that as the text-books teach us the enamel cord passes down to form the temporary teeth, and the process goes on until the sack is formed, it is possible that some remaining fragments of the cord are dislodged and find their way into the surrounding tissues, and that these fragments of the enamel cord might lie dormant for a number of years until certain influences were brought about that would develop them and cause them to erupt. In speaking of cases where the temporary teeth had remained in the mouth until comparatively late in life, the speaker called attention to the fact that he had a patient thirty-five years of age where the temporary canines were still in place, and said he thought it a bad plan to extract these teeth, as it was evident that there had been some influence that had retarded the eruption of the permanent tooth, and nature seems to try to make amends for it in allowing the temporary tooth a long life.

He did not approve of using the term "pushing of the temporary teeth" in speaking of the eruption of permanent teeth following the temporary. He did not believe that such a condition existed as the pushing of the temporary teeth by the permanent. It was simply an absorption or breaking down of the roots of the temporary tooth as the permanent tooth was coming into place.

In speaking of impacted third molar teeth, he advocated devitalizing the nerve in the tooth before extraction was attempted. He said that, from his own experience in that line, he did not believe it would give trouble afterward, if in extraction a portion of the tooth was left in the mouth.

Dr. PRESTON. I understand full well how, if a piece of the membrane that forms the teeth is left in the jaw, teeth may grow from that at any time. Those are what are called supernumerary teeth. Most of the cases that I mentioned were those where the natural teeth at their proper time and place had come through. The real question was why these teeth seemed to set back in the jaw and wait for a faulty place to come through. With regard to the term pushing, used in speaking of the permanent teeth following the temporary, I admit that it is improper to use it except in cases where the temporary teeth are devitalized. In those cases, unless you extract the temporary tooth you will find that the permanent tooth will push the temporary tooth entirely out of the jaw.

On motion the subject was passed, and after extending a vote of thanks to the Rochester members for their attendance and efforts to make the meeting a success, and also to Drs. Freeman, Whipple, and Butler for the very interesting program presented, the meeting adjourned.

THE DENTAL COSMOS

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Devoted to the Interests of the Profession.

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EDWARD C. KIRK, D.D.S.

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EDITORIAL DEPARTMENT.

THE DENTAL CRITIC OF THE MEDICAL PRACTITIONER.

THERE are certain topics which continually crop out at dental association meetings and in dental periodical literature which, to use a dental analogy, seem to grow from a persistent pulp, or, as is said to be the case with *Felis domestica*, seem to be possessed of nine lives. It has become, for instance, almost a habit with many dentists to adversely criticize the medical practitioner for a supposed lack of interest in dental topics, and also for the evils which result in some cases from a disregard of precepts which the average dentist would consider elementary in character. All those who have occasion to peruse dental periodicals know that this tendency is on the increase, in spite of the fact that contributions to medical publications on questions having a direct bearing on dentistry are daily increasing. It is true that a considerable number of cases are on record showing the effects of ignorance on the part of the physician as to the pathology and therapeutics of disorders strictly within the province of the dental surgeon; but it is also true that the pages of medical journals have published at rather frequent intervals articles from which the observant dentist can derive—and undoubtedly has derived—information of the utmost value.

The dental critic of the medical practitioner for the technical ignorance of the latter assumes a position that is not easy to explain upon logical grounds. He usually reports a case or two where teeth have been improperly (?) extracted, or where a poultice has been externally applied for the relief of a suppurative inflammation about a root-apex, and after holding the medical man up to the ridicule of his audience he

flays him with fine scorn by explaining just how the case would have been correctly treated by the educated dental practitioner, and then suggests the necessity for the establishment of chairs of dental teaching in connection with all medical schools.

We are pretty nearly convinced that this sort of thing is wrong, because, in the first place, it is not as a general proposition true that medical practitioners are ignorant of the main pathologic and therapeutic conditions relating to the mouth and its contained organs. Secondly, if it be an error of fact to assert that the physician is ignorant of the general principles under consideration, then adverse criticism based upon such a premise is unjust. There are probably ignoramuses with an M.D. attachment to their names, just as there are other ignoramuses with a similar D.D.S. equipment; but the basal fault in these cases is not that they are M.D.'s or D.D.S.'s, but that they are ignoramuses, and for that reason alone neither are representative of the educational attainment of their professions. It is folly to make use of the errors of which either by reason of his ignorance or incompetency may be guilty as a basis for general criticism of their respective professions. Such a mode of reasoning on that basis of criticism is too obviously open to the *tu quoque* form of argument that begins in a false conception and ends nowhere. We confess to a sensation that is close to a shiver of dread as to what might happen if some well-informed and mentally equipped medical writer should undertake to indulge in the same sort of diversion by writing articles upon what a dentist ought to know about medical practice or criticising the errors of some dentists in the practice of their own specialty.

Now as to the establishment of chairs for dental instruction to medical students. How much dentistry ought a medical man to know? Where shall the line be drawn between the knowledge of the medical and the dental practitioner, or shall the lines be withdrawn? The tendency in the great science and art of healing is toward specialization, and inevitably so, because the extent of its data and the compass of its scientific organization and practice is beyond the capacity of the average human being as at present constituted. It is, however, equally true that all practitioners of the healing art in any of its departments must be thoroughly grounded in those principles and scientific data which are fundamental to the whole art of healing. When that is attained—when the elementary training of the specialist in any sphere of medical science is equivalent to that of any other—the problem will be much simplified, for each will have intelligence enough to recognize the general nature of disease conditions in any of their clinical manifestations, and common sense enough to refer special cases to the technically trained specialist who only is competent to carry out the treatment.

Let us recognize that the only safe measure of professional attainment is the standard of our best results, not our errors or failures. And let us

further recognize that some of the best contributions to dental pathology, and particularly on the relation of dental and oral diseases to general constitutional disorders, have emanated from medical investigators.

THE DENTAL HOSPITAL OF SYDNEY, N.S.W.

WE are in receipt of a pamphlet announcing the formal opening of the Dental Hospital of Sydney, which took place October 17, 1902, the exercises being conducted by His Excellency Governor Sir Harry Rawson.

A competent surgical and dental staff both active and consulting has been organized, consisting of practitioners of well-known ability and attainments. Beside the dental staff, which is composed of eight consulting, twenty active and twenty-three assistant dental surgeons, there are three surgeons, two oral surgeons, two physicians, one radiographer, one pharmacist, and six anesthetists composing the staff.

The objects of the institution are to provide gratuitous advice and surgical aid, and other treatment, in all diseases of the mouth and teeth, to the poor and necessitous who are unable to procure the same at their own expense and whose cases are suitable for dental treatment.

The hospital is supported by voluntary contributions, and its management is vested in its life governors and governors. The secretary is Mr. G. Louis Gillam, 219 Elizabeth street, Sydney, N.S.W.

The establishment of this charitable institution under such favorable auspices marks a decided advance in dental matters in New South Wales; for not only will its beneficent work minister to the needs and relieve the sufferings of the worthy poor to a large degree, but it will afford an unusual opportunity for the study of dental and oral diseases, and thus contribute largely to the ends of dental and surgical education in its particular territory. We wish the new enterprise abundant success.

THE FIFTEENTH ANNIVERSARY CELEBRATION OF THE ODONTOGRAPHIC SOCIETY OF CHICAGO.

LET it be set down as a matter of record that the Odontographic Society of Chicago has brought to successful issue the largest, most enthusiastic, and generally satisfactory meeting of dentists ever held in the history of the world. On the second day over twenty-one hundred dental practitioners had signed the register, and it is conservatively estimated that at least five or six hundred more were in attendance who did not register.

The total registration of the World's Columbian Dental Congress was 1115; that of the Third International Congress of Paris, according to the report of the treasurer (*Comptes rendus*, p. 80), was 1152.

Five papers were read and discussed, and a banquet at which upward of six hundred members and visitors sat down was held on the evening of

the second day. One hundred and twenty-three clinical demonstrations were announced on the program, but this number was largely exceeded at the meeting. Sixty exhibitors of dental supplies contributed to the interest of the meeting.

The arrangements for the comfort and social entertainment of those in attendance were above criticism, and, now that the meeting is a thing of the past, the problem of how it was done is one which may well occupy the thoughtful attention of those interested in the promotion of successful and interesting dental meetings. We have neither time nor space to enter into a discussion of that question here, but we are firmly of the opinion that for reliable information as to how to make a successful dental meeting we shall hereafter be obliged to confer with the officers of the Odontographic Society of Chicago, U. S. A.

MR. FUYT'S DISCOVERY OF THE INDUCED CURRENT IN PULP DIAGNOSIS.

By an unfortunate oversight in the stenographic report of the meeting of the First District Dental Society of New York, published in the January Cosmos, it has been made to appear that Dr. John E. Grevers, of Amsterdam, Holland, was the originator of the application of a weak induced current for the diagnosis of disturbed conditions of the dental pulp. Dr. Grevers made no claim to having originated the method, which is the discovery of Mr. W. J. C. Fuyt, assistant at the Dental Institute of Utrecht, and his account of the discovery and its application is published in *Nederlandsch Tijdschrift voor Geneeskunde*, January 18, 1903.

As the report was not submitted to Dr. Grevers for correction, the omission of credit for the discovery has given rise to some misunderstanding of the situation upon the part of those immediately interested, and in our next issue we shall publish Dr. Grevers' corrected statement and some other matter bearing upon the question which our present space limits preclude our doing in this issue. We take this occasion, however, to add our personal testimony to the fact that Dr. Grevers clearly stated that the method which he was exhibiting in this country was the discovery of Mr. Fuyt, and made no claim whatever to originality in connection therewith. This statement we make solely for the information of those who may not personally know Dr. Grevers; as to those who do know him it would be quite superfluous.

INFORMATION WANTED.—DR. EDGAR O. KINSMAN, 15 Brattle Square, Cambridge, Massachusetts, desires to make inquiry through the pages of the DENTAL COSMOS as to the present address of Dr. John E. Whitmore, late of Paris, France, class of '77 of the Boston Dental College. We cheerfully publish this inquiry with the request that anyone having information on the subject will kindly communicate it to Dr. Kinsman.

BIBLIOGRAPHICAL.

ANATOMY. A Manual for Students and Practitioners. By WILLIAM H. ROCKWELL, JR., M.D., formerly Assistant Demonstrator of Anatomy, Coll. Phys. and Surg., Columbia Univ., New York. (Series edited by BERN B. GALLAUDET, M.D., etc.) Philadelphia and New York: Lea Brothers & Co.

The fact that the study of complicated and extensive subjects like anatomy has been greatly facilitated by the introduction of works in which the discussion of the subject is limited to its more salient points, eliminating from their pages all superfluous and sometimes unnecessary details, has served as a stimulus for the production of a number of abridged text-books.

These little works have without doubt been the source of considerable help to the better class of students, those who do not use them to the exclusion of

the more comprehensive works, but who appreciate their value as guides in the systematic study of these difficult subjects.

Dr. Rockwell's manual, a book of 620 pages, is, however, one from which the student can easily obtain all the knowledge of anatomy with which, speaking generally, he needs to be equipped. It is, as stated in the preface, compact and fairly complete, and while the author modestly states that its purpose is not to replace the larger text-books, it can be safely averred that from its pages the student will more readily acquire knowledge that is assimilable than can be procured from the larger text-books by the same output of effort. The illustrations are carefully made, the press-work is good, and the general make-up of the book is in accord with the publishers' adopted standard.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Dental Register*, January 1903.]

MODERN USE OF SOFT FOIL. By G. S. JUNKERMAN, M.D., D.D.S.

If we exclude the method of insertion, the author says, and look only at quality, it is very generally agreed that gold is the best filling material that we have. He asserts that in his belief there is a physical difference between "soft" and "hard" foil. Soft gold, he states, becomes cohesive by either heat or force, and hard gold, again, becomes non-cohesive by either heat or force. The apparent purpose of this essay is to make an earnest plea for the use of the non-cohesive variety of gold; for the author says that in proportion as teeth need saving, soft gold is the very best filling material that we have. Regarding the instruments to be used in

manipulating soft gold, it is stated that a special set of instruments for this purpose is not necessary, as any plugger that can be used advantageously for cohesive foil is likewise adaptable for non-cohesive foil, and that any good set of cohesive foil pluggers makes a most desirable set for non-cohesive gold. It is further stated that ninety-five per cent. of all fillings inserted can be inserted with soft foil, that this is a humane method, much less painful, and that it requires so little time that it is preferred by patients to all other filling materials.

The author next takes up the cases in which the use of "soft" foil is indicated and those in which it is not. He says that it is not safe to attempt to restore cutting edges of incisors with non-cohesive gold, and that, while he has accomplished this feat, it is of doubtful sta-

bility and endurance. It is usually necessary to have two walls between which to build, not so much for the purpose of retention, but as a matrix which will permit of sufficient force being brought to bear upon the mass to insure cohesion. The two walls form the main matrix, but each piece of gold is used to form a matrix in the mass into which the next piece is to be placed.

The author then gives some further information regarding the insertion of non-cohesive gold, saying that the interlacing of the gold is best accomplished by the use of small instruments, as the larger ones will cause bridging and will fail to induce the necessary cohesion. Centrals, laterals, and canines with buccal and labial walls gone can be easily restored with soft foil. The approximal cavities in molars and bicuspid with a fraction of the lateral walls remaining are also given as examples of cavities which can be perfectly restored with non-cohesive gold, the author adding that every cavity with the exception of those involving the cutting edges can be easily filled with non-cohesive gold.

The author terminates his interesting article with the statement that even the dentist who makes a perfect operation cannot claim skill if at the same time he exhausts the vital energy of his patient. One may be able to cut well, but the skillful surgeon does that and also saves the blood of his patient.

[*Trans. Odonto-Chirurgical Society of Scotland*, Edinburgh, 1901-1902.]

PARALYSIS FOLLOWING EXTRACTION OF RIGHT LOWER THIRD MOLAR. BY J. H. GIBBS, F.R.C.S., L.D.S.

The extraction was not an easy one, and immediately afterward the patient complained of her lip on that side, and upon examination it was found that tactile sensation had disappeared from the middle line of the chin backward for two inches, the line of demarkation being sharply defined in front but not so behind. The area was also sharply defined at the lower border of the mandible. The inner side of the lip, gums, and teeth on that side were also more or less anesthetic. The patient's chief complaint was that the parts involved felt as though very much swollen, and that she could scarcely feel the teeth coming into contact on that side. For three weeks after the extraction there was not much change for the better, but thereafter restoration of function occurred rapidly, and seven weeks after the accident the parts had recovered normal sensation.

[*l'Odontologie*, Paris, January 15, 1903.]

A FEW CONSIDERATIONS REGARDING THE TREATMENT OF CARIES OF THE FOURTH DEGREE, SIMPLE OR COMPLICATED WITH ALVEOLAR ABSCESS. BY DR. MAURICE ROY, PRESIDENT OF THE ODONTOLOGICAL SOCIETY OF PARIS.

The author embodies in this communication the result of his experience regarding the treatment of caries of the fourth degree, and offers in this connection some valuable suggestions. Regarding the use of antiseptics, he says that they should be made to act upon a field free of microscopical debris for the reason that such debris is composed mainly of albuminous matter, which becomes superficially coagulated and acts as a barrier to the further ingress of the antiseptic agent and to its action upon the micro-organisms that are the cause of the disturbance. Dr. Roy is of the opinion that success in the treatment of penetrating caries depends on the way in which the treatment is carried out rather than upon the strength of the antiseptic used, and that if the canals are thoroughly cleaned mechanically the use of even a medium strength antiseptic will give far better results than the use of strong antiseptics if the mechanical treatment has not been performed as suggested. But the mechanical cleansing alone does not suffice, as the dental tissues are not impermeable, and therefore are penetrated by micro-organisms. He recommends the use of the essential oils, which on account of their volatility act also upon the pericementum.

Dr. Roy emphasizes the necessity of working methodically, and describes in detail the method which he has successfully followed. This consists essentially in the mechanical cleansing of the canals, an operation upon which he fully relies. After the thorough cleansing of the canals he inserts a dressing of oil of cinnamon, which he allows to remain in the canals for about ten days, when, as a rule, they are found to be in perfect condition.

While it is by all means probable that in the treatment of putrescent root-canals good results are obtained with the method recommended by Dr. Roy, yet we cannot refrain from calling attention to the slowness of his procedure. Quite as good results can be obtained in less time with some of the methods in vogue in this country. The tendency of modern dental practice is toward rapidity in the performance of operations, especially so in those regarding the treatment and subsequent filling of root-canals, and results as

satisfactory as those recorded by Dr. Roy can be obtained by the use of sulfuric acid, hydrogen dioxid, or sodium dioxid in less time than that claimed by Dr. Roy to be necessary before final and successful obturation of the canals can be performed by the method he advocates.

The author next takes up the treatment of alveolar abscess with gingival fistula. He first treats the canals by the method already described, and then devotes his attention to the treatment of the fistulous tract, first removing all the septic material from the fistula, into which he then introduces dressings of ten per cent. solution of zinc chlorid, which he leaves *in situ* for about half an hour. At a future sitting he concludes the treatment of the canals, and after fifteen days, as a rule, the fistula has become completely obliterated and the tooth is in fit condition for permanent filling. In some extreme cases he makes a large opening of the fistula with the view of thoroughly curetting the alveolus and the root, and concludes the operation with an application of zinc chlorid. The latter plan he follows in cases of chronic abscess.

The object of this communication is not, as the author states, to put forth any new method of treatment, but to record the systematic method of treating some severe infectious conditions of root-canals.

[*l'Odontologie*, Paris, November 15, 1902.]

A CASE OF PULP-VITALITY SUBSEQUENT TO EXTRACTION AND IMMEDIATE REPLANTATION. BY M. MARRONNEAUD, ADJUNCT PROFESSOR OF DENTISTRY, BORDEAUX DENTAL SCHOOL.

The patient, a man aged twenty-five, had his upper second bicuspid extracted, for reasons which the author fails to mention. The tooth was in a healthy condition and therefore its replantation was decided upon. This was performed by placing the tooth in its alveolus and by exercising pressure with the fingers for a few minutes. The replantation was followed by slight periostitis which was not treated and which subsided within five days, and from that time the patient did not experience any further inconvenience.

Four years afterward the patient called on the writer because of acute pain in the region of the location of this tooth, asking that the tooth be extracted as caries had destroyed all the dentin of the crown and part of the enamel. The crown on the tooth was fractured during the extraction, but the root came out easily. Dr. Marronneaud, before deciding upon extraction, examined the tooth carefully

and found that the pulp was hypertrophied and sensitive. The root terminated in two points of normal aspect. In the pulp-chamber dried blood from the pulp could be seen.

From the foregoing description, it will be seen that this is a case of complete pulp-grafting, and therefore presents an unusual degree of interest. The possibility of an error between the tooth that had been replanted and the one that was extracted was completely eliminated.

[*Dental Summary*, December 6, 1902.]

MISTAKEN DIAGNOSIS BY PHYSICIANS.

BY DR. A. O. WRIGHT, STOCKTON, CAL.

The author describes a case of abscess of the right ear and one of disturbances of the eye caused by diseased conditions of the teeth. These two cases had been diagnosed and treated by physicians, but without producing any relief.

Dr. Wright treated the teeth, which he diagnosed as the cause of these disturbances, and by this procedure caused the diseased organs to regain their normal condition.

[*Dental Summary*, January 1903.]

THE MANIPULATION OF PORCELAIN BODIES AS APPLIED TO CROWN AND BRIDGE WORK. BY HART J. GOSLEE, D.D.S., CHICAGO, ILL.

Dr. Goslee tells us that it must be remembered that porcelain is a more or less friable substance, and that as such its inherent and possible strength will increase in proportion to its bulk; also that the degree of strength can be still further increased by skillful manipulation, and that it may be diminished by the opposite. To obtain this degree of strength two features must be observed: First, the metal construction must be strong enough to afford sufficient means of attachment and support for the porcelain; and second, the selection and manipulation of the body must be made with a view to obtaining the best possible results. He recommends that the root be shorter than for any other style of dowel crown in order to make as much accommodation for the porcelain as possible. If a band is used it should be well adapted, narrow, and heavy enough to retain its shape, and the ends should be overlapped if soldered with pure gold. The floor should be heavy enough to form a strong cap, and good contact between it and the band should exist. The dowel should be soldered to the cap. The cervical end of the facing should be ground thin to overlap the band without causing any undue prominence. This over-

lapping of the facing brings itself in close proximity to the gum, and there is then afforded mechanical means of retaining the porcelain, and the formation of a smooth flush joint results. In attaching the facing to the cap the pins should be bent toward the porcelain so as to come in contact with the surplus end of the dowel at a point as close to the cap as possible, or in contact with the floor itself. The soldering of the various parts may be done with twenty-five per cent. platinum solder, which imparts strength to the work by flowing in the spaces where the contact is not perfect, and making a joint which is not re-fused in the furnace during the baking of the crown.

The author next discusses in detail the selection of the body, and in this connection states that the high-fusing variety should be employed for this kind of work, as it is finely powdered to admit of carving; the best results are obtained with porcelain fusing between 2200° and 2600° Fahrenheit. Regarding the care to be exercised in the application of the body, it is stated that the shape and contour may be more easily obtained by applying body mixed to a thicker consistence as the building-up progresses, and when the desired form has been obtained the remaining moisture may be easily and quickly evaporated by passing the crown over the flame until the mass is sufficiently dry to admit of carving.

Dr. Goslee then gives some valuable suggestions regarding the manner of so treating porcelain as to bring it into harmony with the natural color of the teeth, and also in connection with the carving process. He states that the body should not be allowed to overlap upon the band at any place except along the labial and buccal edge where the facing retains it mechanically, as such overlapping surfaces of porcelain will easily exhibit fractures, or may even break off, leaving a rough and irregular joint with the platinum.

When the desired confirmation and outline of the porcelain and blending of the colors has been obtained, the crown should be placed in the furnace and baked until it becomes slightly vitrified, but so that it does not present a highly glazed surface. This is preferable to the so-called "biscuit" bake, because of securing the maximum degree of shrinkage in the first fusing; but the surface should not become vitreous, for the reason that the second application of the body will then not adhere to it so well. The author then discusses the fusing of the porcelain, and gives in this connection some important points. He says

that the fusing of the porcelain may be quite easily accomplished without gold or time tests by simply watching it closely with the eye and observing when the somewhat granular surface changes under heat and gradually becomes smooth and vitreous. The individual fusing of several small cubes of porcelain at different times will enable anyone to acquire a degree of experience and familiarity with its characteristics as it fuses, so that this can be done with accuracy, and any possible danger of impairing the eyesight may be overcome by the use of smoked or colored glasses. The author then concludes his very practical and interesting paper, stating that porosity of the body is one of the chief causes of failure in this work, and that it is due to one of three causes—imperfectly packing, using too much pure gold in the solder, and overfusing the body.

[*Wiener Zahnärztliche Monatsschrift*, January 1903.]

A CASE OF PRIMARY SYPHILITIC LESION ON THE BUCCAL MUCOUS MEMBRANE OF A GIRL AGED SEVEN. BY DR. HERMANN, VIENNA.

According to the researches of Dr. Finger on the occurrence of syphilitic lesions in the mouth (*Wiener med. Wochenschrift*, Nos. 42-45) only eighteen cases of primary lesions upon the buccal mucous membrane are on record. In the case reported by Dr. Hermann the lesion was upon the right side and at the level of the first temporary molar. Dr. Hermann was not able to ascertain the exact cause of this peculiar case of syphilitic infection. The treatment consisted in irrigations with mercury bichlorid, mouth-washes with potassium permanganate, and also thorough cleansing of the denture.

[*International Dental Journal*, Philadelphia, December 1902.]

QUININ SULFATE IN THE TREATMENT OF PERIODONTITIS. BY DR. D. A. FULLER.

The author describes the case of a patient who exhibited all the symptoms of an incipient alveolar abscess on the lower left second molar. Dr. Fuller found that the local dentist of the town where the patient came from had opened the pulp-canal. The pain had been very intense during the forty-eight hours preceding the examination of the case by the author. He proceeded to treat the tooth by first syringing it out repeatedly with hot water, after which he placed a piece of cot-

ton very loosely in the cavity to keep out foreign matter. He also ground the cusp on the opposing tooth so that the two teeth would not meet. But in the meantime the operator learned that the patient was subject to frequent attacks of malaria and therefore decided to administer quinin. The patient was instructed to take eight grains of quinin at once, and to continue it in two-grain doses during the day at intervals of an hour. A few hours afterward the pain had subsided, and the morning after the administration the tooth had receded almost to its normal position and had tightened very perceptibly in its socket, showing that the inflammatory condition was greatly relieved.

In concluding, the author says that for the past six or seven years he has prescribed quinin in a large number of cases, and has found almost invariably that the patient has been relieved, a considerable number having been greatly benefited, and that where the malarial symptoms are prominent in an asthenic person the use of quinin is indicated.

[*Revue Odontologique*, Paris, December 1902.]

LUXATION OF THE INFERIOR MAXILLA. BY DR. HERVOCHON, CHIEF OF CLINIC AT THE ÉCOLE ODONTOTECHNIQUE.

The author describes a case of unilateral dislocation of the temporo-maxillary articulation in a girl, nineteen years of age.

The patient had a lower molar extracted. The operation was very painful, and two days afterward she observed that the mandible had descended slightly and was deviated considerably toward the right. The dislocation was treated during five weeks, but without any results, when the patient was brought to Dr. Hervochon for treatment. The face did not present any abnormal appearance, no swelling was present, and only the deviation of the mandible could be noticed.

The essayist did not experience any difficulty in placing the mandible in its normal relations, but as soon as it was left to itself it went back to its abnormal position. Dr. Hervochon therefore decided that it would be useless to attempt this operation again, as nothing would remove the ligaments that were crowding the glenoid cavity unless an intense pressure could be exercised against the mandible for a period of at least fifteen days, with the view of preventing the mandible from moving. He decided on this account to treat the case by adjusting a splint that would inclose the mandible completely. The splint was provided with leather straps which were tightened around the head of the patient. The

patient at first suffered very acute pain from the extreme pressure exercised against the glenoid cavity. This pain lasted for a few days, but gradually subsided and eventually disappeared entirely. Fifteen days afterward the splint was removed, as the mandible had returned to its normal position; as a matter of precaution, however, the splint was readjusted every night for about a week, to avoid any possible recurrence of the disturbance.

[*Deutsche Monatsschrift für Zahnheilkunde*, Leipzig, January 1903.]

TREATMENT OF A PERSISTENT HEADACHE CAUSED BY THE PRESENCE OF DISEASED ROOTS. BY WALTER WORM, ZAHNARZT, GLEIWITZ.

The author describes the case of a woman aged forty-five who for the last three years had been suffering from a headache of such intensity that at times it became practically unbearable. The patient had observed that the pain was invariably located upon the right side of the head, and that if occasionally both sides became painful, the abnormal sensation upon the right side was always more intense than that upon the left. The pain would disappear for two or three days after the administration of morphin or phenacetin, which as a matter of fact constituted the only treatment she had received from the several physicians she had consulted in regard to her intense suffering.

Recently the patient called on the writer, as she wished to have a complete set of teeth made. Herr Worm made a thorough examination of the mouth and discovered the presence of the roots of the upper left second bicuspid and first molar and those of the right central and lateral incisors and canine. The roots on the left side were not painful, but those on the right side responded painfully to pressure. They were all extracted, and since then the patient has not suffered any headache, and, four months having elapsed since the extractions were performed without any painful recurrence, it is reasonable to suppose that the patient is completely cured.

[*Dental Brief*, Philadelphia, February 1903.]

SOME NOTES CONCERNING PREPARATION OF TEETH FOR MICROSCOPICAL STUDY. BY MARTHA ANDERSON, M.D.

The author states that in decalcification of teeth the results have been far from satisfactory. In order to protect the dentin and preserve the pulp and dentin *in situ* the slower methods of decalcification are better, but the delay has disadvantages.

The author states that Andrews' solution is the only one that has given results that can be called good. This solution is composed of 140 parts of chromic acid, 6 parts of nitric acid, and 400 parts of water. It has the disadvantage of very rapid action, as the solution in full strength completely destroys the entire tooth in a few hours. The author uses it in half strength, changing it about every hour.

In preparing pulps for microscopical study, the essayist recommends that the pulps be removed from fresh teeth and that they be hardened in Müller's fluid. For staining cellular elements Van Geisen's method is very satisfactory. The author then describes Weigert's method for the staining of medullated

nerves. This method is as follows: Harden in Müller's fluid, stain in a saturated solution of neutral copper acetate for twenty-four hours; wash, and submit to a stain composed of hematoxylin 1 part, alcohol 10 parts, saturated solution of lithium carbonate 1 part, for twenty-four hours, then rinse in water and deodorize in borax 2 parts, potassium ferricyanide $2\frac{1}{2}$ parts, water 200 parts. The nerve will stand out a peculiar brown compared to the other tissues.

In studying sections by this process, one nerve-trunks can be seen running from the apex of the pulp and branching off higher up, the fibrils running along the outer edge of the pulp just beneath the layer of odontoblasts.

PERISCOPE.

Protect the Eyes.—Colored glasses should always be worn when doing bright and glaring work with the blowpipe or porcelain furnace.—S. E. KISER, *The Bur*.

Teeth of School Children.—A dentist of Germany states that out of 5300 school children examined, only 4.37 per cent. had sound teeth.—*Canadian Journ. of Med. and Surg.*

Sensitivity of the Tongue.—The most sensitive part of the human body is the tip of the tongue. Next come the lips and then the tips of the fingers.—*New York Medical Times*.

Inserting Gutta-percha or Cement.—To keep gutta-percha or cement from adhering to the instrument while inserting in a cavity, dip the instrument into talcum powder or powdered soapstone.—*Dental Review*.

Removal of Gold Matrix from Inlay.—The gold matrix may be easily and thoroughly removed from the inlay by immersing in aqua regia (nitro-hydrochloric acid) for twenty or thirty minutes.—D. W. BARKER, *Dental Summary*.

Poisoning from the External Use of Chromic Acid.—Several cases of profound toxic symptoms (going on to death, it is believed by some) have resulted from the external use of chromic acid solution. No doubt these cases were idiosyncratic, yet the fact remains and should be heeded.—*Monthly Cyclopædia*.

Enlarged Tonsils.—It is well to bear in mind the fact that enlarged tonsils lessen the capacity for proper breathing, and that once they are inflamed they serve as a possible point of entry for all manner of infections.—*Internat. Journ. of Surgery*.

Hydrogen Dioxid, in the form of a thirty per cent. solution, has been used with complete success as a styptic in hemorrhage due to polyps of gums and pulp-extirpation. A piece of surgical sponge is saturated with hydrogen dioxid and inserted in the pulp-chamber.—*Dental Summary*.

Use Rubber Dam When Inserting Amalgam Fillings.—Don't neglect the use of rubber dam in amalgam filling. There are few fillings that would not receive better manipulation with the dam rather than with the hurry of napkins and cotton rolls.—HAROLD CLARK, *Dominion Dental Journal*.

Matching of Colors in Porcelain Work.—One thing that is discouraging to beginners is the fact that an inlay which matches the tooth perfectly before cementation will be found several shades off on account of the opacity of the cement. Of course it should be remembered that each inlay should be set with a cement approximating it in color. To those who are thus discouraged, let me say that within a few months there will be a blending of cement, porcelain, and tooth, so that the disparity of color will disappear.—T. P. HINMAN, *Dental Headlight*.

Treatment of Hypersensitive Dentin.—Dr. Fayoux (*l'Odontologie*) treats sensitive dentin by filling the cavity with a paste made by mixing together zinc oxid and eugenol. A paste thus made hardens in the presence of moisture, and when allowed to remain in the sensitive cavity for eight, fifteen, or more days causes the disappearance of all sensitivity.

In Case of Hemorrhage, Do Not Give Stimulants.—It is a good general rule never to give whiskey or other stimulants to a person who is bleeding, because it is apt to increase the hemorrhage and to augment the person's excitement. Keep your stimulants away until after the bleeding has stopped, and they are often unnecessary by that time.—*Internat. Journ. of Surgery*.

Testing Dental Materials.—The profession should not look to a few men to make the sacrifice of time, energy, and money necessary to test all of the various materials offered for sale to dentists. There should be some better and broader way of getting at it—some central laboratory sustained by the profession where tests of this kind might be made and the results given to the profession.—C. N. JOHNSON, *The Bur*.

Bleaching Teeth.—Success in bleaching the teeth demands recognition of the fact that each special case presents its peculiar characteristics, and that the problem is a chemical one always, as the bleaching method in any case must be selected with special reference to the character of discoloration and applied with care, for without that care success is impossible.—S. A. ALDRICH, *Penn Dental Journal*.

Thorough Malleting of Contact-Point in Approximal Gold Fillings.—In gold fillings the contact-point should receive more than the ordinary amount of malleting, and in this connection it may be stated that if for no other reason than this a matrix is indicated in filling these cavities when they occur on the distal surfaces of the teeth. With a thin matrix lying between the filling and the approximal tooth, the gold may be solidly driven against the contact-point of the tooth without injury to the enamel on account of the protection afforded it by the matrix, and when the filling has been properly contoured and hardened and the matrix removed, the gold will be found in perfect contact with the approximal tooth, and with very little finishing necessary to make a good surface.—C. N. JOHNSON, *Dominion Dental Journal*.

Training for the Beginner in Porcelain Work.—The beginner should select medium-sized and accessible cavities, and as he acquires skill in the management of the matrix he can attempt more difficult cases. No work requires the delicacy of manipulation that is encountered on porcelain inlays, and the practice of this branch where indicated will not only be pleasing to the refined patient but will reflect credit upon the operator.—LEVITT E. CUSTER, *Dental Summary*.

Short Operations for Children.—Just as in school short and lively recitations please the children, so in the dental office the operation should not be continued too long, and the interest of the child should be kept up, if possible, throughout. As soon as he appears to tire, the work should, after the tooth has been dressed with an antiseptic and temporary stopping, be deferred until another sitting. Our future to a great extent depends on how we use the children.—T. R. PATERSON, *Dominion Dental Journal*.

Combination Fillings for Root-Canals.—Our well-known preference is for gutta-percha at the foramen and oxychlorid for the balance of the canal. By this method we avoid the objectionable features of both materials when used separately, viz, the leakage in gutta-percha and the forcing of oxychlorid through the foramen. Used in the way we have recommended, these materials logically and practically combine more of the qualities of an ideal root-filling than can be obtained with any of the other materials commonly used.—*Western Dental Journal*.

Thoughts on Pyorrhea.—When the destruction caused by pyorrhea can no longer be made good, we need not for that reason speak of incurability. If we succeed in arresting the purulence, the pyorrhea is cured; and this only succeeds when we are able to remove every trace of subgingival tartar deposits. No one will, of course, expect that it is possible to refix a loose tooth the alveolus of which the presence of pus has caused to disappear up to the apex of the root. Loose teeth, however, may become fixed again if a part of the alveolus remains still healthy, if about a third of the tooth still stands in healthy bone, or, in other words, if the last third of the tooth in the direction of the apex of the root has remained free of deposits. In teeth with several roots the conditions are somewhat different if the pathological process has not progressed to an equal extent with all the roots.—ALBERT SENN, *Quarterly Circular*.

Waxing Up Artificial Teeth Made Easy.

—Take the bottom of a greased tin box, put your old scraps of base-plate wax in it, melt them up hot, then paint on the wax with an artist's paint-brush one-quarter inch wide. Keep wax hot, and laugh to think how easily you can do it. I do not know but that this is old, but it is original on my part—never saw anything in print or ever heard anyone mention the thing. If it is new score me one, for it is the first original idea I ever had.—E. C. FRENCH, *American Dental Journal*.

Treatment for Putrescent Root-Canals with Essential Oil-Carbolic Acid Mixture.

—In the treatment of abscesses and of root-canals generally I have found the following mixture most serviceable. Take of oil of cloves and carbolic acid crystals equal parts. Melt the carbolic acid crystals by heat and add the oil of cloves. This mixture is easily prepared and possesses in marked degree the desirable qualities of the essential oil-carbolic acid mixture. If used with reasonable care it will not discolor the teeth in which it is placed.—F. W. STEPHAN, *Items of Interest*.

How to Hold Teeth Loosened by Pyorrhea.—Teeth which have become so loose as to be constant sources of irritation should be extracted. This improves the condition of the mouth generally, and often seems to retard the progress of the disease; but extraction of affected teeth, even in an early stage of pyorrhea, does not put an end to the progress of the disease, nor do more than temporarily check its advance. When numerous teeth have been lost, great comfort will often be afforded by the adaptation of a perfectly fitting frame of vulcanite to embrace the necks of the remaining teeth, and to hold artificial substitutes in the vacant places.—HENRY SEWILL, *Quarterly Circular*.

How to Dislodge Matrix from Cavity.

—If all directions have been followed and no undercuts left in the cavity, the matrix can easily be dislodged by the aid of a thin, flat instrument passing under one of the corners. Another way to remove it is with yellow wax, pressing it into the cavity with the ball of the finger; and when the finger is removed the matrix will be found clinging tightly to the wax and the wax to the finger. The wax can be removed by dipping it in boiling water or holding it a few minutes in a Bunsen or alcohol flame. Great care should be taken to see that the matrix is perfectly clean, as any carbon remaining from the burnt wax will discolor the porcelain.—T. P. HINMAN, *Dental Headlight*.

What Kind of Filling Material should be Used in Extensive Cavities?

—In those extensive cavities where decay has so encroached upon the pulp that its death would almost surely follow if the tooth were filled with a metallic filling although the cavity be lined with the best non-conductor you know of, porcelain will give one almost absolute security; the pulp will remain alive and the tooth comfortable. Clinical experience has taught us that porcelain is the best non-conductor of thermal changes, and practically restores the tooth to as nearly normal a condition as though decay had never occurred.—W. T. REEVES, *Dental Summary*.

Odorless Disinfectant.

R—Alum, 10 parts;
Sodium carbonate, 10 parts;
Ammonium chlorid, 2 parts;
Sodium chlorid, 2 parts;
Zinc chlorid, 1 part;
Hydrochloric acid, sufficient;
Water, 100 parts.

Dissolve the alum in about fifty parts of boiling water and add the sodium carbonate. Dissolve the resulting precipitate of aluminum hydrate with the aid of just sufficient hydrochloric acid, and add the other ingredients previously dissolved in the remainder of the water.—*Chemist and Druggist*.

Repairing of Chipped Inlays.—Chipping may occur on the grinding surface of a molar or bicuspid. Even from a good joint the cement will sometimes slightly wash, when the crushing strain from the opposite tooth may readily chip the unsupported porcelain; this gives renewed opportunity for the washing out of the cement and for further chipping. Chipped margins in molars or bicuspids where a slight line of metal will not be objectionable can be easily mended in the following manner: The edge should be cut out with a fine fissure bur and filled with gold or amalgam. The method of filling is as follows: Wash out the fissure with alcohol and dry. Place in the fissure a small quantity of thin oxyphosphate of zinc and squeeze it out with pieces of sponge gold, being careful not to make lateral pressure on the filling in a way to dislodge it. Let the cement harden, then cleanse the margins, condense the sponge gold, and finish the filling in the usual way. Where amalgam is used, the cement should be squeezed out by soft amalgam in the same way; the margins then cleansed, and amalgam dried of its excess mercury added until the filling is of the proper consistence to set well.—JOSEPH HEAD, *Dental Summary*.

Cause of Breaking of a Vulcanite Denture.—Another fertile cause of the breaking of a vulcanite denture is the not recognizing the fact that each natural tooth on the model makes an indentation in the rubber. Now, if one when molding the wax to such a model should get it attenuated or thinned over the convexity represented by the tooth, then one has a weak spot that does not require much of a strain to snap the case in halves; so that too much care cannot be exercised in keeping the contour of the model, so that the rubber plate may present as nearly as possible an even thickness.—HARRY ROSE, *Journ. Brit. Dental Association*.

The Ethical Dentist.—To be a successful practitioner, a dentist should be ethical. It is not necessary for him to be a society member to command the respect and esteem of a dental society, but a dental society member should rigidly uphold the ethics of his society, for they tend to refine our thoughts, our works and our associations as individuals. Our ability is judged largely by our conduct. I venture to say that dental ethics was in the minds of those gentlemen who organized the first dental society over half a century ago. The knowledge we have attained was a natural consequence of our association with refined and intelligent thinkers. So let me remind you that whatever the profession has achieved in the past has been largely through the influence of our societies, which have stood for the highest in ethical teaching and scientific attainment, and also as a bulwark against quackery and charlatanism.—F. P. HAMLET, *Items of Interest*.

Non-Cohesive Gold: Its Perfect Adaptation to Cavity Walls.—Non-cohesive gold may serviceably be made the basis of most of the gold fillings we insert, and in many instances it may be used to advantage for one-half and even two-thirds of the filling. Its advantages lie in the fact that it can be built up in much less time than an equal bulk of cohesive gold, and that it is more readily adapted to the walls of the cavities, thereby accomplishing the chief end of a filling by effectually sealing the cavity. This statement should not be interpreted as an intimation that perfect adaptation is not possible with cohesive gold. Cohesive gold may be made to hermetically seal a cavity, but its manipulation is more exacting and the process slower than with non-cohesive gold. Non-cohesive gold can be condensed in larger masses than cohesive with less danger of bridging over spaces and leaving air-holes.—C. N. JOHNSON, *Dominion Dental Journal*.

Repairing a Gold Crown.—Just suppose you have made a gold crown and in finishing you perforate the shell, making an unsightly hole. If you undertake to solder this, the chances are you will have three or four holes caused by the solder melting out at the joints. To prevent this trouble, paint the crown all over the outside with whiting mixed thin, except around the hole which you wish to repair; fill this with a plug made from gold foil, touch it up with a drop of borax water, and put a bit of gold solder inside, heat it with blowpipe, and success will be the result.—E. A. RANDALL, *Dominion Dental Journal*.

Preparation of Approximo = Occlusal Cavities in Bicuspsids and Molars.—Cavities of this class should be formed with a flat gingival wall instead of with a curved wall, as is so often done. The gingival wall should join the buccal and lingual walls at right angles, and whenever possible there should be a distinct angle where the axial wall joins the gingival, buccal, and lingual walls. There should be a sharp point-angle in the gingival-axio-lingual and gingival-axio-buccal corners of the cavity. The occlusal anchorage step should also be given a flat seat for the filling to rest upon, and this should join the surrounding walls of the step at right angles. A cavity so formed will admit of the filling being started with the greatest possible ease and with no danger of subsequent rocking under the mallet.—C. N. JOHNSON, *Dominion Dental Journal*.

The Care of the Mouth in Its Relation to Disease.—Our readers will remember that we called attention some months ago in our review columns to a small monograph by Dr. Hunter, of London, in which he detailed observations which led him to believe that pernicious anemia was often produced by infection of the stomach from an unclean mouth. While these somewhat radical views have not attained universal acceptance, at the same time they possess a sufficient amount of truth to make us regard cleanliness of the mouth as an important factor in the treatment of various diseases, and we all know how greatly the comfort and indeed the health of patients suffering from acute infectious diseases is increased if the buccal mucous membrane be kept clean and moist. Years ago, before the importance of this was recognized, it was not a very uncommon thing for secondary infections from the buccal mucous membrane to occur, but at the present time, in typhoid fever in particular, such complications and sequelæ rarely occur.—*Therapeutic Gazette*.

Strengthening of Lower Plates.—To add to the strength of an ordinary lower case where the bulk of rubber and teeth is not excessive in the molar regions, an ordinary piece of wire slightly thicker than pin size, and carefully adapted to the model so that it lies along the necks of the teeth, is quite sufficient, in my opinion, to give the case the necessary amount of rigidity, and it is in this position well imbedded in the substance of the rubber. To this wire I usually solder the clasps of bands. This serves a double purpose,—first, as a retention for the clasps to hold them in the vulcanite, and secondly, when the bands or clasps are imbedded in the plaster in the flask, they in turn help to keep the wire strengthener in its proper position. The soldering of the bands to the wire should be neatly done so as not materially to decrease the thickness of the rubber at the point.—HARRY ROSE, *Journ. Brit. Dental Association*.

Bleached Shellac.—Although many processes have been suggested for the preparation of this, so far as I am aware, only one is used to any extent on a practical scale. This process is a modification of the original one proposed by Willstein, omitting the alcohol, which is as unnecessary as it is expensive. The shellac is dissolved in a suitable alkaline solvent and treated with chlorinated lime. An alkaline carbonate being used, the lime eventually settles as carbonate, and the full action of the sodium hypochlorite in solution is exerted. The solution is treated with sulfuric acid, which precipitates the shellac in a nearly colorless form. Bleached shellac retains a large quantity of water, even when in a quite hard state. It probably retains some chlorin, which would entirely vitiate any method of analysis depending on an iodine estimation; but the pressure of rosin in bleached shellac is easy to detect, and an approximate determination of it can be made.—E. J. PARRY, *Chemist and Druggist*.

Spinal Anesthesia with Tropacocain.—Neugebauer (*Wien. klin. Woch.*, No. 50, 1901) states that Schwartz has reported very satisfactory results with this drug in doses of 0.25 c.cm.; Bier has had a similar experience. The solution should be freshly prepared each time. The instruments should not be laid in carbolic solution before use, for in two cases in which this was done poisoning resulted. Anesthesia usually begins at the end of a minute, and appears first in the perineum, then the genitalia, the posterior portion of the thigh, the feet, the legs, and finally in the inguinal and abdominal regions.

In the lower extremities one may be sure of absolute anesthesia of the skin incisions, and almost always of the deeper tissues and bones. The serosa remained painful in a Bassini operation and also in an extirpation of the rectum. In operations on the extremities, the anesthesia remained longer in many cases in the leg which was full of blood than in the other one in which the circulation was normal. In thirty-nine cases a 0.005 c.cm. solution was used with success, and in eighteen cases 0.006 c.cm. The stronger solution undoubtedly gives a longer period of anesthesia. The author states in conclusion that a freshly prepared dose of 0.05 or 0.06 c.cm. of tropacocain is an absolutely sure and harmless method of inducing anesthesia of the lower extremities, perineum, and neighboring regions.—*Amer. Journ. of the Med. Sciences*.

Pineapples as Digestants.—Digestive enzymes are contained in many fruits; particularly well known is the juice of the papaw. The *Carica papaya*, or South American papaw, has a ferment in its juice which has a very powerful proteolytic action. Under the name of papain, papoid, etc., the enzyme is found in the market. Another plant which contains a powerful ferment is fresh pineapple juice. It also has a powerful digestive principle, which has been termed "bromelin." It is capable of digesting one thousand times its own weight. Like papoid, it acts in a neutral, acid, or alkaline medium, and it is supposed will continue its action after reaching the intestine. The active principle of the juice is precipitated by dissolving much sodium chlorid in it; it is destroyed by boiling.

When it is considered that a good-sized pineapple contains as much as a pint of juice, its cheapness as a digestant commends itself, and may thus replace the expensive preparations of papoid. A few teaspoonfuls of pineapple juice should be recommended when there is a deficiency in the digestion of proteids. One question arises, however: Are the peptones formed by the vegetable enzyme the same as those formed by the animal ferments? Can the intestinal epithelium utilize the digestive product without any further change? These questions have not as yet been answered.—*St. Louis Courier of Medicine*.

Some Physical Principles Applied in Dentistry.—Capillary attraction is but another form of adhesion, and has many practical applications in dentistry. It is this force that enables us to separate teeth by the use of cotton, tape, cardboard, etc., packed or

drawn between them. By capillary attraction the fluids are taken up by these substances, forcing the fibers apart and gradually exerting a pressure sufficient to move the teeth in their sockets. To the writer, one of the most valuable and satisfactory applications of this principle is in the application of medicinal agents to root-canals in the treatment of pulpless teeth. When it is desired to flood the canal with the medicament, to insure its reaching the apex of the root, a broach as nearly the size of the canal as possible is passed to the apex in the empty canal. By dipping the point of the closed foil pliers into the agent to be used, a sufficient quantity will be retained between the beaks by capillary attraction, and when the points of the pliers are placed at the opening of the canal into which the broach has been passed and the pliers allowed to open slowly, the fluid is deposited at the mouth of the canal and by capillary attraction, when the broach is gently worked laterally, is passed between the walls of the canal to the apex. The broach serves the double purpose of displacing the air in the canal and aiding the capillary force, thus insuring the passage of the fluid to the apex.—N. C. LEONARD, *Dental Headlight*.

The Administration of Water in Disease.—G. Frank Lydston, M.D., writes: Since the advent of the various theories of uric acid pathology, and the recognition of the value of the ingestion of large quantities of water in the treatment of the various conditions in which the poisonous products of tissue metabolism are supposed to be the *fons et origo mali*, this simple method of treatment has often been carried to extremes. (1) While the ingestion of large quantities of water in various affections is often of great value, the treatment is sometimes extremely detrimental. (2) The nutritive value of the blood is often impaired by the relative hydemia produced by the ingestion of large quantities of water. (3) Disturbances of the circulatory and nervous systems are frequently produced by it. So-called weak heart, palpitation, nervous irritability, lassitude, and exhaustion on slight exertion are among the phenomena that may result. (4) Serious digestive disturbance, involving impairment of the secretion and composition of the gastrointestinal juice, and gastro-motor insufficiency may be produced by the ingestion of water in large quantities. (5) Edema and anasarca, while often relieved by the free ingestion of water under favorable circumstances, are not infrequently enhanced by it. (6) Renal

water habit may develop, by virtue of which the kidney becomes permanently sluggish unless it receives its wonted stimulus of large quantities of water. (7) Acute and chronic inflammatory affections of the kidney are sometimes aggravated by giving water in excess simply by overworking the renal organs. (8) Inflammatory affections of the lower portions of the genito-urinary tract are often deleteriously affected by excessive water-drinking through mechanical disturbance necessitated by the resultant frequent and copious micturition.—*Med. News*.

Fætor of the Breath of Gastro-intestinal Origin.—When fætor of the breath is not obviously the result of some abnormality of the mouth or throat, it is nearly always due to some of the more deeply lying organs of nutrition, generally the intestines. And this is the case in spite of the fact that in many such instances there is no complaint which points to the fact of the function of these organs being in any way disturbed. But, of course, all other sources of the symptoms must be carefully sought out. It may be that the esophagus is the source of the trouble. As the author points out, cancer of the organ or any other condition which leads to retention of food may give rise to tainted breath. In many cases the stomach is the organ which is at once blamed, but the author finds that very often this viscus is free from reproach. Not seldom, indeed, in cases of severe indigestion of gastric origin, there is no complaint whatever of tainted breath, whereas the annoyance may be markedly present in cases in which the functions of the stomach are quite normally performed. The author finds that in the large majority of cases it is the intestine that is at fault, and he gives details of several cases in which attention to this mode of origin of the malady was followed by complete cure. In treating these cases it is most important to remove constipation, and to secure regular and free evacuation of the bowels. And the amount of nitrogenous food should be strictly limited; in many cases it is better to restrict the patient to a diet from which meat is wholly excluded. It is needless to say that the symptom is the result of decomposition within the alimentary canal. With the intention of counteracting this decomposition, the author recommends the administration of menthol in doses from 0.1 to 0.15 gm. in combination with sugar. The drug may be given in capsules. It is, of course, very necessary that every possible care be taken to keep the mouth and teeth absolutely clean.—H. W. S., *Treatment*.

HINTS, QUERIES, AND COMMENTS.

A METHOD TO AVOID THE CHIPPING OF PORCELAIN TEETH IN SOLDERING.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Having had a great deal of trouble with plate teeth chipping at the incisal and approximal edges from borax in soldering, I have been experimenting in the hope of overcoming this, and I find the following plan to be most effectual.

After the teeth are ground and backed I coat the porcelain facings with a rather thick coat of ordinary sperm oil, and then wax up. When the case is properly waxed, recoat the

facings freely with oil and invest. When the wax is removed apply oil to the investment where borax is likely to penetrate, then heat up and solder in the usual manner. In all instances I use a camel's-hair brush with which to put the oil on.

By following the procedure here indicated I find my failures lessened fully ninety per cent.

Trusting the foregoing will be a help to the readers of your magazine, I am

Yours very truly,

ORMOND E. WALL, D.D.S.

HONOLULU, Jan. 26, 1903.

OBITUARY.

SAMUEL T. JONES.

DIED, at his home in Philadelphia, January 31, 1903, SAMUEL T. JONES, late treasurer of The S. S. White Dental Manufacturing Company, in the seventy-third year of his age.

Mr. Jones was born in Philadelphia, October 9, 1830. During his early manhood he acquired considerable experience in commercial affairs, and for a time held a position in the United States Assay Office in New York. He entered the service of Dr. Samuel S. White August 17, 1859, and from that time until his death he continuously held important positions of trust. During the lifetime of Dr. White, Mr. Jones occupied the position of private secretary and head of the correspondence department. On January 1, 1880, he was appointed to the position of cashier, and upon the formation of The S. S. White Dental Manufacturing Company, July 1, 1881, he was elected treasurer, which office he held until his death. In these positions he was brought into business relations with great numbers of the dental profession, notably with the thousands of graduates of the several dental colleges in Philadelphia; and great numbers of dentists now practicing not only in the United States, but all over the civilized world, will recall his genial manners

and willing attention to them during the years of their student life.

In his work, as in his life, he was above reproach, industrious, faithful, and exact—a model financial officer. When he entered the employ of Dr. White nearly forty-four years ago it was truly “a day of small things.” And when he became cashier in 1880, the handling of the finances of the house was but a trifle in comparison with what it is to-day. During his twenty-one years of service as treasurer, however, the position grew to be one of great responsibility, and he fulfilled with signal ability all of its requirements. He was modest, genial, pure in heart, and at all times a thorough Christian gentleman. He was never in very robust health, and for several years past had suffered much, but he was always patient and uncomplaining, keeping at his post as long as it was possible. Some four months ago he was compelled by increasing weakness to give up entirely his visits to the office.

The house founded by Samuel S. White has been remarkable for the long—often life—service of many who have been connected with it. There have been several instances on its records of those who were in continuous service for over fifty years. It was al-

ways a source of pleasure to Dr. White, and is to-day to those upon whom has fallen the management of the business he founded, that the employees, from the small number of over fifty years ago to the army of to-day, have as a rule been so happy in the service and so devoted to the interests of the house. Mr. Jones in his nearly forty-four years of service was a conspicuous example of this. It is safe to say that to him his work was a pleasure, and his service was conspicuous for its faithfulness. He was ever willing and faithful, and in his associations with others always kindly and genial. Those who are left will miss him greatly, and there are some who stood with him in the heat and burden of the day who feel lonely when they realize that he will be with them no more on earth.

Mr. Jones was a member of St. Mary's Church, Philadelphia, with which he had been connected since 1860. He was elected vestryman January 13, 1880, which position he filled until the spring of 1902. He was appointed rector's warden November 5, 1895, and was also accounting warden from April 19, 1881, to June 6, 1881.

On February 16, 1860, he was married to Miss Adelaide S. Eakin, daughter of Col. C. M. Eakin, U. S. Army, who survives him. He left four sons, two of whom are in the service of The S. S. White Dental Manufacturing Company, one of them being at present its secretary.

The funeral services were conducted at his late residence, February 2d, by the Rev. Thos. C. Yarnall, rector emeritus, and Rev. Dr. Arnold, rector of St. Mary's Church, and were attended by a large number of friends, including officers and employees of The S. S. White Dental Manufacturing Company. The interment was in the Woodlands Cemetery.

H. M. L.

DR. FREDERICK JAMES STARR.

DIED, at his country residence in Mt. Vernon, N. Y., October 18, 1902, Dr. FREDERICK JAMES STARR, in his fiftieth year.

Frederick James Starr was born in Grand street, New York city, July 13, 1853, of an eminent professional family. His father, Dr. Alfred Starr, was one of the eminent dentists of his time, and is now living in Milford, Conn., where he made his home after his re-

tirement from professional life. Dr. Ira Starr, an uncle of Dr. Starr's, was a skilled dentist and for a long time conducted a large practice in New York city. A cousin, Dr. A. R. Starr, is now professor of operative dentistry in the New York College of Dentistry.

The boy Frederick showed at an early age a general aptitude for science and mechanics. He was sent to the New York public schools when very young, and before he was sixteen was apprenticed (with Dr. Dudley Tenney and Dr. E. J. Seaman) to his father. Under his father's tutorship he benefited by a parent's interest in his future welfare, and the result was that at nineteen he opened an office in New York city, on Lexington avenue near Forty-first street. He began immediately, by dint of hard, conscientious work and close application, to form the nucleus of a large and wealthy practice. This was in 1871. In 1879 he was registered before the Registering Board in New York city, and a few years later removed his offices to West Thirty-fourth street, where he remained until 1898. From there he went to No. 226 West Forty-third street, where ill health compelled him to give up his New York practice, and he retired to his beautiful home in Mt. Vernon. He was forced to retire from active life in May 1902, on account of the illness that eventually proved fatal. He had taken a heavy cold, which he had almost disregarded, and it had settled into bronchitis; this in turn developed into tuberculosis of the larynx, and he died quietly, in the midst of his sorrowing family, October 18, 1902. He is buried in the family plot in Bethel, Conn.

Dr. Starr's career was an interesting as well as a valuable one to the dental profession. He was the inventor of a valuable amalgam carrier and a dozen other instruments which he generously donated to the profession. Dr. Starr was a member of the New York State Dental Society, but dropped out of it after a few years. He was a charter member of the Xavier Sodality, of which many prominent professional men are members, and was also a charter member of the Crescent Club of Mt. Vernon. While in Thirty-fourth street he was appointed dentist to the Convent of the Sacred Heart in Manhattanville, the Convent of the Sacred Heart in Seventeenth street, and the Convent of the Sacred Heart at Fifty-fourth street and Madison avenue. He was a

skillful prosthetist and was especially apt in the art of regulating teeth.

His military career was long and meritorious. When quite a young man he joined the drum corps of the Second Regiment as a drummer under Drum Major Michael Cregan. Later he enlisted in the Third Regiment, in Captain Henry Huss's company, and was honorably discharged with the rank of first lieutenant. After that he entered company F of the Seventh Regiment and rose to a second lieutenancy. Still fascinated by military life he joined the Seventy-first Regiment as a private, and was honorably discharged in 1882 as a sergeant. He was with the regiment in New Orleans, La., at the opening of the Baltimore and Ohio Railroad, when they attended the Mardi Gras.

On December 10, 1873, he married Susan Dederer, of Mt. Vernon, a granddaughter of Stephen Hopkins, one of the signers of the Declaration of Independence.

His wife and her three children—Almira Dederer, Frederick James, and Gertrude Hopkins—all survive him.

The cutting short of this valuable career while yet in its zenith is an irreparable loss to the dental profession, but we are satisfied that his life was not in vain, and that the good that has gone out of it to the profession and to the public will be lasting.

W. R. S.

DR. CHARLES F. HOWELL.

DIED, suddenly, of heart failure, at his residence in Rochester, N. Y., on December 31, 1902, C. F. HOWELL, in his fortieth year.

Dr. Howell was born in Bath, N. Y., in 1863 and studied dentistry with Dr. A. Osgood of that city. Afterward he removed to Rochester and formed an association with Dr. P. H. Smith, first as assistant and later as partner. About twelve years ago Dr. Howell opened offices on his own account in Rochester, building up for himself a practice which at the time of his death was one of the best in that city. He successfully passed the examination of the New York Board of Censors, receiving the degree of M.D.S., which until three years ago was conferred by that body.

He was a member of the Dental Society of the State of New York, the Seventh District

Dental Society, and the Rochester Dental Society, and was also an active member of the Masonic order. In the various societies of which he was a member he always took an active interest, and he was a frequent participant in their discussions as well as a contributor to their work.

Dr. Howell was married about a year ago to Miss Helen Moore of Toledo, Ohio, and had only recently moved into their new home. She survives him, and, together with a large circle of friends, deeply mourns his untimely decease.

DR. HERBERT D. CURRIE.

DIED, at Cambridge, Mass., September 15, 1902, of gastro-intestinal inflammation, after a brief illness, HERBERT DUNNING CURRIE, D.D.S.

Dr. Currie was born in Reswick, York county, New Brunswick, July 13, 1856. He began the study of dentistry under the preceptorship of his brother, Dr. Willard A. Currie, of Cambridge, Mass., and was graduated from Boston Dental College in April, 1885. After graduation he entered upon practice in Fredrickton, N. B., where he remained until 1892, when he removed to Cambridge, Mass., and entered upon the practice of his profession with his brother. There he continued until his death. He was a member of the Council of Dental Surgeons of New Brunswick, and fellow of the Boston Dental College.

Dr. Currie was married eleven years ago to Miss Ella Boone, Presque Isle, Me., who, with one son, survives him.

DR. GEORGE A. TABER.

DIED, at his home in Dorchester, Mass., November 18, 1902, of heart failure, Dr. GEORGE A. TABER.

Dr. Taber was born in New Bedford, Mass., December 31, 1830. He studied dentistry with Dr. E. G. Ward of New Bedford, Mass., and began practice in that town in the late '50's. Dr. Taber was twice married, and he is survived by his second wife and their three children, and a daughter by his first marriage.

Dr. Taber was a man of sterling character, loved and respected by all who knew him, and his sudden death came as a painful shock to his large circle of friends and acquaintances.

SOCIETY NOTES AND ANNOUNCEMENTS.

FOURTEENTH INTERNATIONAL CONGRESS OF MEDICINE.

THE Fourteenth International Congress of Medicine will be held in Madrid, under the auspices of their majesties King Alphonso XIII and the Queen-Regent, April 23 to 30, 1903. The Congress will be composed of physicians, pharmacists, dentists, veterinarians, and all others who practice any branch of the healing art.

The registration fee is thirty pesetas (about \$6.00). The amount of this fee must be paid to the secretary-general of the Congress, Faculty of Medicine, Madrid, who will in turn forward to the applicant an identification card. Each member should forward with his registration fee a memorandum in which his full name, titles, and address should appear. These data should be accompanied by the member's visiting card.

The Congress will be divided into the following sections: (I) Anatomy (Anthropology, Comparative Anatomy, Embryology, Descriptive Anatomy, Normal Histology, and Teratology). (II) Physiology and Biological Chemistry and Physics. (III) General Pathology, Pathological Anatomy, and Bacteriology. (IV) Therapeutics, Pharmacology, and Materia Medica. (V) Internal Pathology. (VI) Neuropathy, Mental Diseases, and Chemical Anthropology. (VII) Pediatrics. (VIII) Dermatology and Syphilography. (IX) Surgery. (X) Ophthalmology. (XI) Otology, Rhinology, and Laryngology. (XII) Odontology and Stomatology. (XIII) Obstetrics and Gynecology. (XIV) Medicine and Military and Naval Hygiene. (XV) Hygiene, Epidemiology, and Technical Sanitary Science. (XVI) Legal Medicine.

The reading of each communication must not take over fifteen minutes, and the members taking part in discussions must not speak more than five minutes. All communications must, if possible, be accompanied by a short *résumé* in the shape of conclusions. This summary will be printed by the executive committee, and will be distributed to the members of the session to which the paper belongs.

The official languages of the Congress will be Spanish, French, English, and German.

The committee of organization of Section XII, in which dentists are especially interested, is as follows: Luis Guedea, professor of the Faculty of Medicine, president; R. Sanchez, vice-president Spanish Odontological Society, and H. B. Heddy, vice-presidents; Florestán Aguilar, professor odontology, Univ. Madrid, secretary-general; I. Gallardo, L. Subirana, J. D. Losada, adjunct secretaries. Members—H. Salcedo, A. Lopez Alonso, Madrid; P. Carol, J. Plet, J. Alonso, Barcelona; D. Casasnovas, A. Cladera, L. Ferar, Palma; A. Baca, F. Ponce, Malaga.

All correspondence regarding the work of the section should be addressed to the secretary, Dr. Florestán Aguilar, Serrano 5, Madrid.

TEMPORARY PROGRAM.

1. "Treatment and Obturation of Teeth with Diseased Pulps." Professor Oscar Amoëdo, Paris; Dr. J. D. Losada, Madrid.
2. "Dental Microscopy." Dr. J. Leon Williams, London; Professor T. Choquet, Paris.
3. "Bucco-Facial Prosthesis and Prosthesis of the Skeleton." Dr. Claude Martin, Lyons; M. Delair, Paris.
4. "Dental Education." Professor Godon, Paris; Professor Aguilar, Madrid.
5. "Nature and Treatment of Pyorrhea Alveolaris." Dr. Hopewell-Smith, London; Dr. Younger, Paris; Dr. Damians, Barcelona.
6. "Local Anesthesia in Dentistry." Professor Sauvez, Paris.

Up to October 25, 1902, the following communications had been reported to the secretary-general:

- "Immunity to Dental Caries." Professor W. D. Miller, Berlin.
- "Sterilization of Dentin." Professor Choquet, Paris.
- "Internal Anatomy of the Head." Professor Cryer, Philadelphia.
- "Porcelain Inlays." Dr. Jenkins, Dresden.
- "Dentistry Among the Primitive Inhabitants of Italy." Dr. Guerini, Naples.
- "Surgical Treatment of Palatal Defects." Professor Brophy, Chicago.

"Bridge Work." Dr. Weiser, Vienna.

"Dental Histology." Dr. Zsigmondy, Vienna.

"Porcelain in Conservative Dentistry." Dr. Mamlock, Berlin.

"Pyorrhea Alveolaris." Dr. Good, Chicago.

Other communications will be presented by Drs. Mitchell, London; Aguilar, Madrid; Amoëdo, Paris; Cunningham, Cambridge; Boniquet, Barcelona; Casasnovas, Palma; Subirana, Madrid; Chiavaro, Rome.

The International Dental Federation and the American Dental Society of Europe will also hold their annual meetings in Madrid from April 23 to 30, 1903.

Further information on the nature and work of Section XII (Odontology and Stomatology) will be gladly furnished by Dr. Florestan Aguilar, Serrano 5, Madrid, Spain.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-fifth annual meeting of the New York State Dental Society will be held Wednesday and Thursday, May 13 and 14, 1903, in the assembly hall, Hotel Ten-Eyck, Albany, N. Y.

The following well-known members of the profession will present papers on subjects to be announced: E. C. Kirk, Philadelphia, Pa.; M. H. Cryer, Philadelphia, Pa.; M. L. Rhein, New York city, N. Y.; Edward J. Line, Rochester, N. Y.; R. M. Sanger, East Orange, N. J.; J. F. Knapp, Geneva, N. Y.; F. T. Van Woert, Brooklyn, N. Y.; H. D. Hatch, New York city, N. Y.; A. R. Cooke, Syracuse, N. Y.

Exhibitors desiring space will communicate with Dr. J. R. Appleton, 89 Columbia st., Albany, N. Y.

Members of the profession are cordially invited. Headquarters, Hotel Ten-Eyck.

R. H. HOFHEINZ, *Pres.*, Rochester, N. Y.

W. A. WHITE, *Sec'y*, Phelps, N. Y.

VERMONT STATE DENTAL SOCIETY.

THE twenty-seventh annual meeting of the Vermont State Dental Society will be held at the Van Ness House, Burlington, March 18, 19, and 20, 1903.

All members of the profession are cordially invited.

THOS. MOUND, *Sec'y*, Rutland, Vt.

ODONTOLOGICAL SOCIETY OF WESTERN PENNSYLVANIA.

THE Odontological Society of Western Pennsylvania will meet in Pittsburg, Pa., Tuesday and Wednesday, March 10 and 11, 1903.

It is expected that this will be the largest meeting of any in the history of the society. The executive committee are arranging with some of our best lecturers, as well as a great number of exhibitors, so as to make it the most successful meeting ever enjoyed.

C. B. BRATT, *Pres.*,

B. M. LOAR, *Sec'y*.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

THE Southern Wisconsin Dental Association will hold its annual meeting at Janesville, Wis., May 20 and 21, 1903.

Every effort is being made to have a large and interesting meeting. Prominent members of the profession will present papers, and some of the most noted clinicians will operate.

All reputable members of the profession are cordially invited.

C. W. COLLVER, *Sec'y*, Clinton, Wis.

FIRST DISTRICT DENTAL SOCIETY, N. Y.

THE First District Dental Society of the State of New York holds its regular meetings at the New York Academy of Medicine, 17 W. Forty-third st., New York city, on the second Tuesday evening of each month.

Officers: Chas. A. DuBois, president; Henry D. Hatch, vice-president; Jas. W. Taylor, treasurer; B. C. Nash, secretary; F. L. Stanton, librarian. Executive Committee—Wm. Carr, A. L. Swift, and F. L. Fossume.

B. C. NASH, *Sec'y*, 142 W. 78th st.

MASSACHUSETTS DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Massachusetts Dental Society will be held in Boston, in Mechanics Building, on Wednesday and Thursday, June 3 and 4, 1903.

EDGAR O. KINSMAN, *Sec'y*,

Cambridge, Mass.

MASSACHUSETTS BOARD OF REGISTRATION IN DENTISTRY.

A meeting of the Massachusetts Board of Registration in Dentistry for the examination of candidates will be held in Boston, Mass., March 4, 5, and 6, 1903. Candidates who have applied for examination will report to the secretary Wednesday, March 4, at 9 o'clock A.M., at Tufts College Dental Infirmary, corner Huntington and Rogers aves., and come prepared with rubber-dam, gold, plastic filling materials, and instruments, to demonstrate their skill in operative dentistry. Anyone who wishes may bring his patient. So far as possible patients will be furnished. The board in every instance selects the cavity to be filled. Partially prepared cavities never accepted.

The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridge work, orthodontia, anatomy, histology, surgery, pathology, materia medica, therapeutics, physiology, bacteriology, anesthesia, chemistry, and metalurgy, and will be held at Civil Service Rooms, State House, from Thursday, March 5, at 9.30 A.M., until Friday P.M., March 6.

All applications, together with the fee of twenty dollars, must be filed with the secretary of the board on or before February 25, as no application for this meeting will be received after that date. Every candidate for examination must be twenty-one years of age. Application blanks may be obtained from the secretary.

Candidates who have taken an examination, and failed, and desire to come before the

board again at this meeting are not required to fill out a second application blank, but must notify the secretary as above in order to be examined. The fee for third and subsequent examinations is \$5.00.

G. E. MITCHELL, D.D.S., *Sec'y*,
25 Merrimack st., Haverhill, Mass.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE thirty-ninth annual convention of the Connecticut State Dental Association will be held at Hartford, on Tuesday and Wednesday, April 21 and 22, 1903.

FREDK. HINDSLEY, *Sec'y*,
Bridgeport, Conn.

NEBRASKA STATE DENTAL SOCIETY.

THE Nebraska State Dental Society will hold its annual meeting in Lincoln, Neb., May 19-22, 1903.

The profession cordially invited.

H. R. HATFIELD, *Cor. Sec'y*.

TEXAS STATE DENTAL ASSOCIATION.

THE Texas State Dental Association will hold its twenty-third annual meeting in the city of Houston, May 14, 15, and 16, 1903. This meeting promises to be the best ever held in Texas. All members of the profession are invited to attend.

BUSH JONES, *Sec'y*, Dallas, Tex.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JANUARY 1903.

January 6.

No. 717,594, to WILLIAM J. MILES, JR. Dental broach.

January 13.

No. 718,401, to JACOB A. THOMAS. Dental finishing-strip package.

No. 718,561, to CLAUDE R. BASFORD. Attachment for dental engine.

January 20.

No. 718,614, to HERMANN FRIEDLAND. Artificial tooth-crown.

No. 718,772, to HENRY A. KING. Dental napkin-holder.

January 27.

No. 719,312, to EDWARD J. DOUHET. Dental disk-holder.

THE DENTAL COSMOS.

VOL. XLV.

APRIL, 1903.

No. 4.

ORIGINAL COMMUNICATIONS.

THE QUESTION OF THE TRANSPARENCY OF THE DENTIN.

By W. D. MILLER, D.D.S., M.D., Ph.D., Sc.D., Berlin, Germany.

THE question of the nature and cause of the increased transparency or translucency of the dentin frequently met with in sections of teeth is one of those which has been dealt with by many of the greatest authorities on questions of dental pathology without a decisive conclusion having been arrived at. Writers on this subject may be divided into two general groups, of which one advocates the view that transparency of the dentin is a vital phenomenon, while the other holds that it is independent of any vital process. Most advocates of the latter view pronounce it to be the result of a partial decalcification.

In the following communication I shall deal principally with the question:

IS THE PHENOMENON REFERRED TO AS TRANSPARENCY OR TRANSLUCENCY OF THE DENTIN THE RESULT OF A VITAL OR OF A CHEMICAL PROCESS?

It should be borne in mind that we frequently meet with appearances, in sections of dentin, which closely resemble those designated as transparency of the dentin, but which are purely of artificial origin. In a section through any

large tooth—for example, the molar or tusk of an elephant—we never find the dentin to be equally transparent or opaque in all parts; the differences being due partially to slight inequalities in the thickness of the section and to differences in the degree of dehydration and impermeation with the clearing fluid (xylol, etc.). This latter is in turn influenced by the angle at which the dental tubules are cut in different parts of the section. Care should be taken that transparent zones or spots of this kind are not confounded with those of natural origin.

These same conditions exist, to a certain degree, in sections of human teeth, and may be illustrated by Fig. 1. We here have a section of a tooth which was worn for many years on a plate in the mouth and was extensively decayed on both approximal surfaces. Bordering the decayed portions we see what might at first sight be taken for transparent zones, such as commonly precede the decay of dentin. A closer examination clearly reveals the fact that the transparency, which includes the whole of the lower portion of the specimen and ex-

tends on the right side quite to the cutting edge, is entirely independent of the caries and is only an apparent transparency brought about by the increased *opacity* of the upper portion of the specimen, which was but imperfectly permeated by the balsam. Again, we sometimes see dark lines caused by imperfect dehydration of the specimen, which brings about an apparent transparency

We find an increased transparency of the dentin occurring with such regularity in connection with certain disturbed conditions of the teeth that we have no reason to doubt that a certain interdependence exists between them. These conditions are chiefly caries and abrasion, less frequently fractures, cracks in the enamel, teeth undergoing resorption, etc. (Figs. 3 and 4.)

FIG. 1.



Section of an incisor, worn on a plate, showing apparent transparency. (10:1.)

(apparent only) of the intermediate zones.

In the roots of senile teeth we usually find the transparency of the dentin more or less increased. In some cases such roots are amber-like and in not too thick sections semi-transparent.

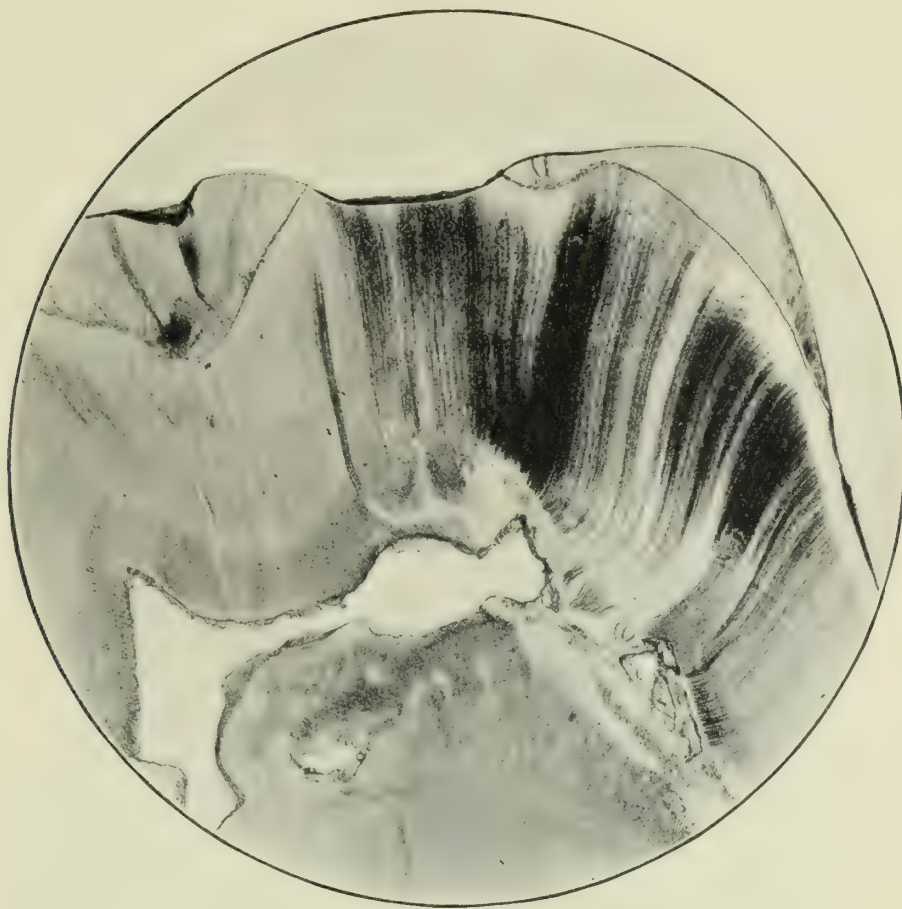
In the crowns of teeth—particularly senile teeth—we likewise find alternating streaks of transparent and opaque dentin which appear to be in part of vital origin and in part artificial, decalcification being entirely excluded. Such a case is shown in Fig. 2. The appearances shown here may well be of vital origin, since they stand in connection with an extensive formation of secondary dentin.

I shall here endeavor to contribute something toward the solution of the question—

IS THE INCREASED TRANSPARENCY OBSERVED IN THESE CASES A VITAL PHENOMENON, OR IS IT THE RESULT OF A BEGINNING DECALCIFICATION BY THE ACIDS OF CARIES?

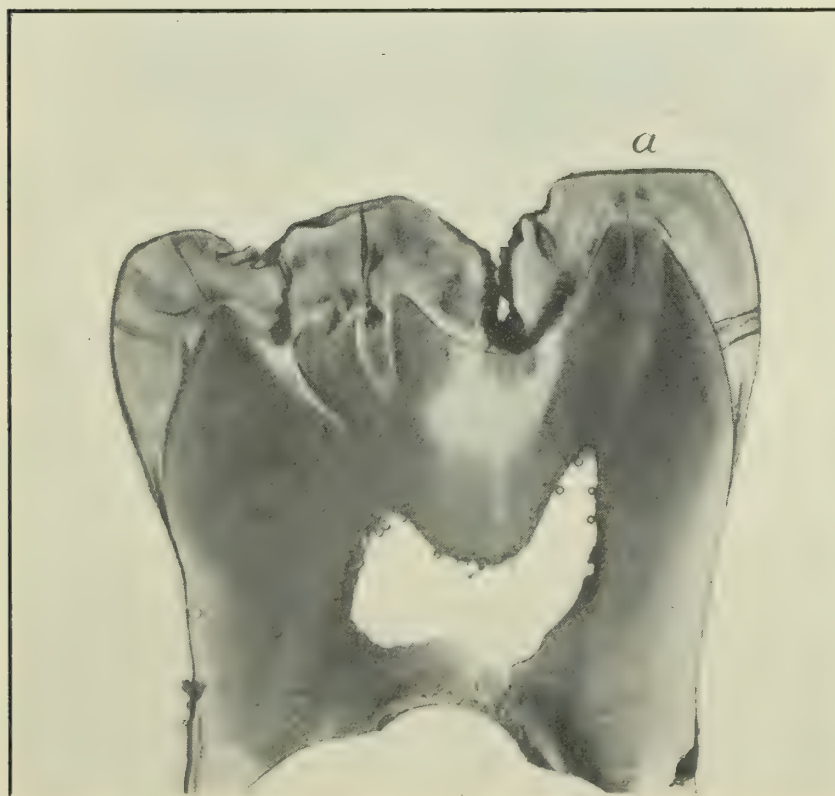
We have no difficulty in answering this question for cases resulting from abrasion or any other kind of mechanical irritation, as represented in Figs. 3 and 4, *a*. No one would claim that there had been any chemical action, from without at least, upon the dentin in these cases; we are forced to accept them as a vital mani-

FIG. 2.



Alternating transparent and opaque zones associated with secondary dentin in a non-carious, abraded tooth. (20:1.)

FIG. 3.



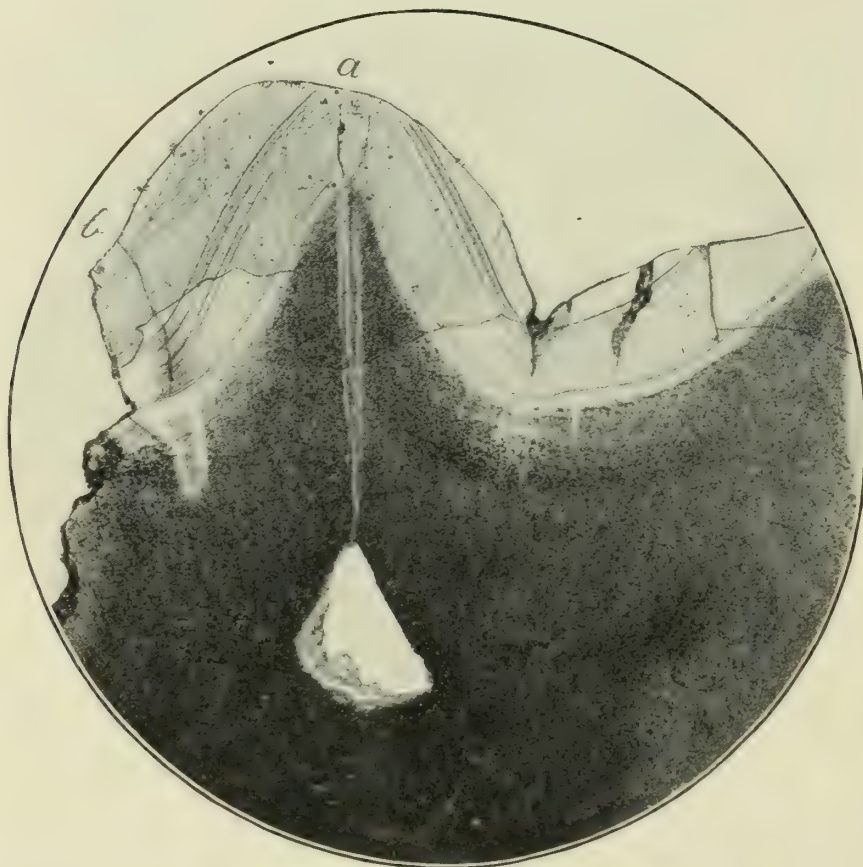
Section of molar showing typical transparency. At *a*, transparency resulting from abrasion of the cusp. (10:1.)

festation, whether it be in the form of a solidification of the dentin or of a rarefaction. The great similarity of the transparency in these cases with that accompanying caries of the dentin tempts us to draw the conclusion that this latter must have a similar origin. Let us see whether such a conclusion would be borne out by other facts.

If the transparent zone accompanying caries were due to decalcification, it

were simply immersed or suspended in the solution, so that the acid acted upon the whole surface; others were coated with sealing-wax so as to expose one point only. All were kept at the temperature of the human body. I also tried drawing or forcing dilute lactic acid through the dentin in the following manner: The point of the root of a fresh incisor or canine was excised and the cusp ground down sufficiently to

FIG. 4.



Transparency resulting from cracks in the enamel at *a* and *b*. (20:1.)

seems that we ought to be able in some way or other to produce it artificially. In this we have not yet succeeded.

I have subjected many teeth to the action of various dilute acids, chiefly lactic and acetic, in strengths varying from $\frac{1}{8}$ of 1 per cent. to the concentrated solution, also to the acids produced in fermenting mixtures of carbohydrates and saliva, for periods varying from a few hours to four and one-half months, but have not succeeded in producing anything analogous to the transparency that accompanies caries. (See Figs. 7 and 8.)

In these experiments some of the teeth

expose the dentin. The root end of the tooth was then fixed air-tight in the end of a glass tube (Fig. 5, *a*) communicating with an exhausting flask. Over the crown end of the tooth a short piece of *strong* rubber tubing (*b*) was placed, and after a few drops of a 1 per cent. solution of lactic acid were filled into this tube it was lengthened by a glass tube some three feet long having an S-shaped curvature at the lower end.* In teeth in which no secondary dentin had been

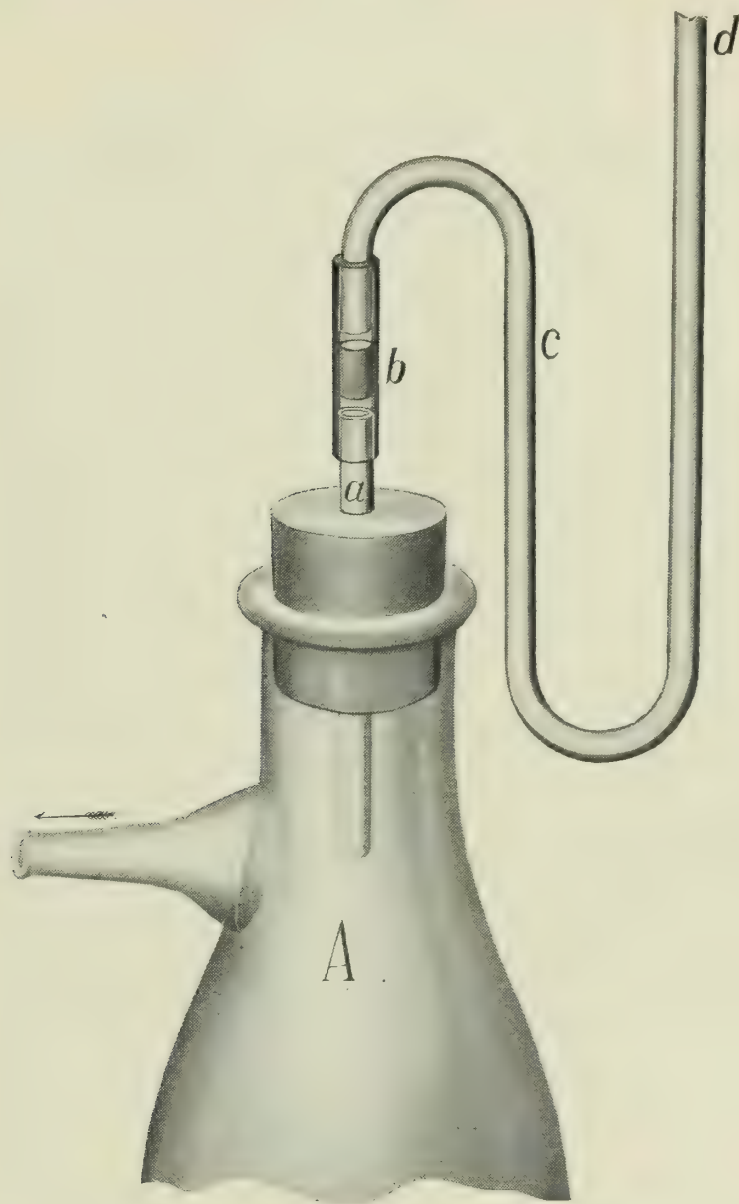
*This tube was filled with mercury, which exerted a pressure of some 15 pounds per square inch upon the acid solution in the rubber tube.

formed I succeeded in a few hours, by the application of both suction and pressure, in forcing, or drawing, enough acid through the dentin to partially decalcify it; no transparency, however, was produced, and the dentin readily stained with eosin.

The following observations concerning

one to one and a half hours. In forty-eight hours the enamel of the dogs' teeth was totally destroyed; that of the human teeth scarcely more than one-half. Under the action of a 2 per cent. solution of acetic acid the enamel cuticle did not at all separate from the surface of the tooth, but in two days the entire enamel with

FIG. 5.



Apparatus for conducting acid solutions through dentin. *A*, exhausting flask; *a*, glass tube with tooth fixed in upper end; *b*, rubber tube covering the tooth and filled with acid; *c*, glass tube extending three feet above *d* and filled with mercury.

the action of acids upon the hard tissues of the teeth seem to be worth recording:

In all cases the action upon the dentin and the cement where exposed was much more pronounced than upon the enamel. A 2 per cent. solution of hydrochloric acid dissolved away the enamel cuticle of human as well as of dogs' teeth in

the exception of traces could be scratched off with the finger-nail. The enamel of human teeth was much less affected in the same time.

A 2 per cent. solution of lactic acid acted in very much the same way, and again to my surprise the enamel of the dogs' teeth was much sooner destroyed than that of the human.

Stronger solutions of acid of whatever nature seemed to have but slight penetrating effect upon the enamel, destroying the tissue progressively, and I was not able to produce changes like that shown in Fig. 6, where the acid has permeated the whole thickness of the enamel and has begun to act upon the dentin before any loss of substance has taken place.

Where the decalcification has gone on more slowly, as in $\frac{1}{8}$ or $\frac{1}{4}$ of 1 per cent. solutions of organic acids, or in mixtures of saliva and bread, I have been able to obtain considerable decalcification without destruction of the enamel (Fig. 9), those specimens having more resemblance to that shown in Fig. 6.

My experiments seem to show that strong acids produce destruction of the

FIG. 6.



Decalcification of enamel without loss of substance. (35:1.)

Fig. 7 shows us the effect produced by a 1 per cent. solution of lactic acid in ten days; and we see that the destruction almost keeps pace with the decalcification.

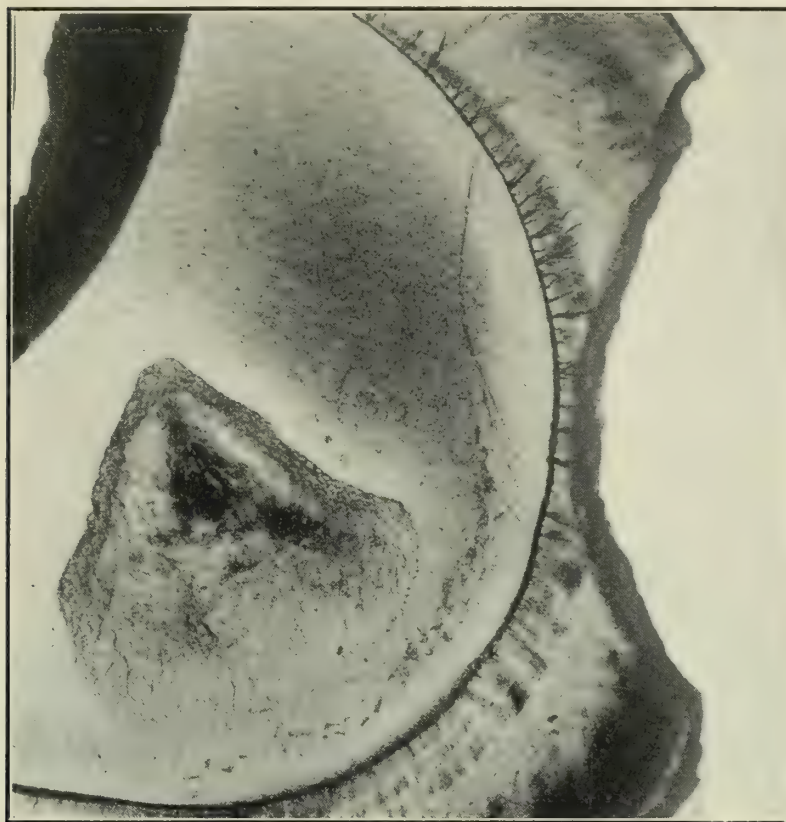
Fig. 8 is a section from a tooth which had been acted upon by a 2 per cent. solution of acetic acid for eight days. The action is here very much the same, only farther advanced, the enamel being totally destroyed and the dentin attacked. Here again we have an accidental transparency of the lower and opacity of the upper half of the section.

enamel without penetration, whereas weak acids, acting through many months or years, may penetrate very deeply without producing any external loss of substance.

THE VITAL FACTOR.

At one time the thought suggested itself to me that it might not be possible to produce this penetrating action on dead teeth, and that the life of the tooth might have something to do with it. In order to test the action of lactic and acetic acids on the living tooth tissue, I

FIG. 7.



Action of a 1 per cent. solution of lactic acid in ten days. (30:1.)

FIG. 8.



Action of a 2 per cent. solution of acetic acid in eight days. (30:1.)

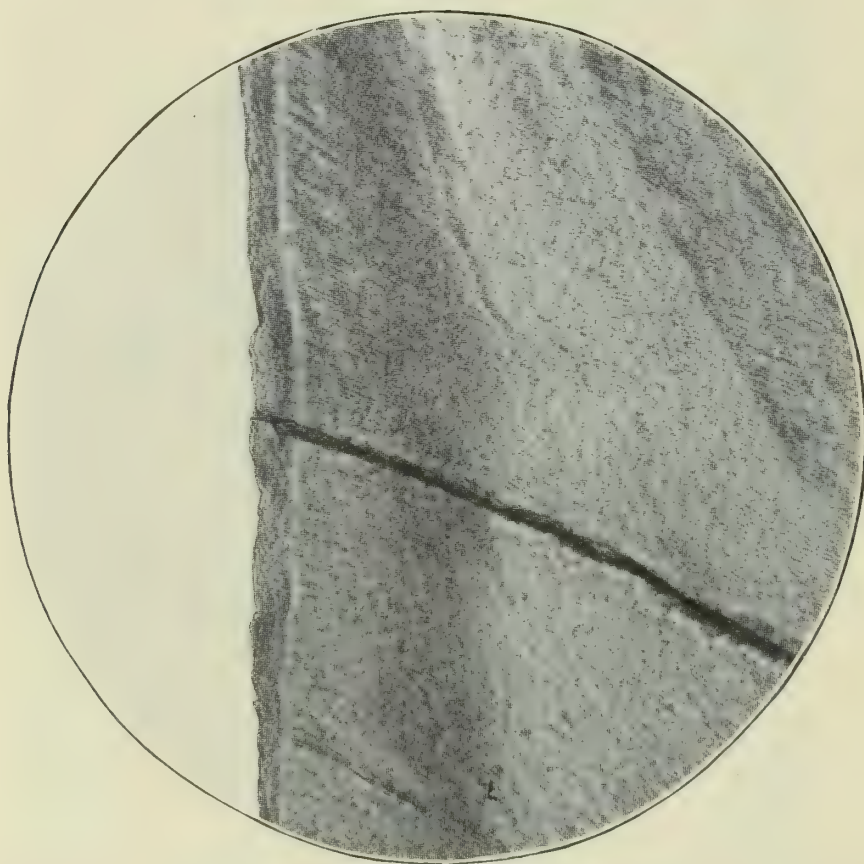
capped the four canines of a dog with gold caps which were perforated on the facial surface by a hole about 2 mm. in diameter, into which a tube $2\frac{1}{2}$ mm. long was soldered. The caps were set on the teeth with phosphate cement, and every other day a $\frac{1}{2}$ of 1 per cent., a 1 per cent., and a 2 per cent. solution of lactic acid, and a 2 per cent. solution of acetic acid were placed on the tubes on cotton and sealed in with Fletcher's artificial dentin. As no effect seemed to be produced

In no case in my experiments on dead teeth did I succeed in producing anything resembling transparency.

When there were cracks in the enamel, the acid followed them through considerable thickness of the enamel (see Figs. 7 and 9), and began to work its way into the dentin, extending with about equal rapidity in all directions.

The microscopic appearances produced by the action of dilute acids and of the bread-saliva mixture presented the great-

FIG. 9.



Artificial decalcification without destruction of tissue. Tooth ten weeks in a mixture of saliva and bread. (50:1.)

on the enamel, I increased the strength of the solutions considerably, and yet after six weeks I had produced but a very superficial action. At this time I made the discovery that the cement used had a strong alkaline reaction and completely neutralized the acid except where the latter had been used in very high concentrations; so that the slight action upon the enamel was accounted for and my time and trouble had been lost. I think, however, that the experiment is well worth repeating, using some other substance, perhaps wax, for sealing in the cotton.

est similarity to those found in natural caries. The segmentation of the prisms was well marked in cases where it was also visible in the normal enamel, but in some cases it was very indistinct or quite wanting, and again very pronounced in one part of a section while quite absent in another, as we find it in natural caries.

I call particular attention to this fact here, since the idea has been repeatedly brought forward during the last year or two that we may have decay of the teeth without the agency of acids. This view was taken also by Preiswerk in a lecture

before the Central-Verein Deutscher Zahnärzte (see *Deutsche Monatsschrift für Zahnheilk.*, October, 1902, p. 492). He founds his argument on the assertion that there can be no decalcification without striation of the enamel prisms, and since we often meet with carious enamel which shows no striation he concludes that acids cannot have had anything to do with the decay in these cases. My experiments prove that Preiswerk's major premise is wrong, since I have many specimens decalcified in mixtures of saliva and bread which show no striation whatever except where it was present before the decalcification.

Mr. Bennett (*Trans. Odont. Soc. Gt. Brit.*, vol. xviii, p. 42) affirms that if it could be proved that there was a transparent zone connected with caries in even one specimen from a tooth which had been worn on a plate the downfall of the theory of vital origin would be inevitable; he also exhibited three specimens which he claimed showed the translucent zone pretty clearly.

TRANSPARENT ZONE AND DEVITALIZED TEETH.

I cannot agree with Mr. Bennett on this point. Some months ago I secured an artificial denture containing fourteen teeth on a celluloid base and immediately removed one of the bicuspid, which showed incipient caries on the approximal surface, and ground down a section. A typical case of beginning caries with the translucent zone was revealed. On inquiring I found that the plate had not fitted properly, and that the patient had not worn it more than half a dozen times for a few hours. In other words, the caries and transparency had originated while the tooth was still living in the human jaw and not while fastened to the plate.

In another case a lower incisor was examined which had been worn on a plate for many years and was extensively decayed on both approximal surfaces. A ground section of the tooth showed not a trace of transparency preceding the carious portions, but distinct transparent

bands extending from one of the angles of the tooth, where the enamel was wanting, to the corresponding horn of the pulp. At the same point, however, we observe a deposit of secondary dentin in which the transparent band terminates, as well as other changes clearly showing that the whole process must have taken place while the tooth was yet alive.

Again, I have a tooth which had been mounted on a base of ivory by means of a wooden peg. It showed on the surface next to its neighbor mounted in the same way a large facet clearly indicating that the tooth had done service in its natural alveolus for many years. In short, the teeth which were used for artificial dentures were all such as had formerly seen service *intra vitam*.

Many years ago the deceased Dr. Franz of Berlin gave me a number of teeth (about fifty, if I remember rightly) such as he had been in the habit of using for artificial dentures. They were strung upon a string through holes bored in the roots. All had seen more or less extensive wear in the mouth, and many had dark spots on the approximal surfaces, such as we so often find to indicate the presence of transparent zones in the dentin. A tooth of this kind examined years later, after it had been worn on a plate—whether the caries had advanced farther or not—would show the same transparent zone, the presence of which, so far from overthrowing the vital theory of transparency, really proves nothing more than that we must not be misled by our observations.

Bearing in mind the fact that in cases where there is unmistakable evidence that the caries really began *subsequent to the mounting on a plate* and where the possibility of a preformed transparent zone can with certainty be excluded, transparency is invariably absent, we are justified in referring all changes of the nature of typical transparency to the time when the tooth was still alive.

The only evidence of value would be that given by such a preparation as is shown in Fig. 10, where the position of the caries is such as to render it probable

that it was not present, even in its vital stage, when the tooth was mounted on the plate. If we had here a broad transparent zone, anything like that seen in caries of living teeth (Fig. 3), and at the same time absolute proof that there was no mistake as to the tooth having become carious while on the plate and having been perfectly intact beforehand, then and only then the vital theory might be considered to have received a severe blow.

I have also been able to establish the absence of transparency in pulpless teeth which have decayed in the mouth, in all cases where one could with reasonable certainty exclude the possibility of an increased transparency having been brought about while the pulp was still living.

A typical case is shown in Fig. 12. There the walls of the pulp-chamber have been attacked by decay, and we can be sure that the process did not take place

FIG. 10.



Section from a lower incisor worn on a plate. Extensive decay without increase of transparency. (15:1.)

Fig. 11 would not furnish us with any evidence, even if a transparent zone were present, for in this case the caries is on the approximal surface and might well have had its beginning *intra vitam*.

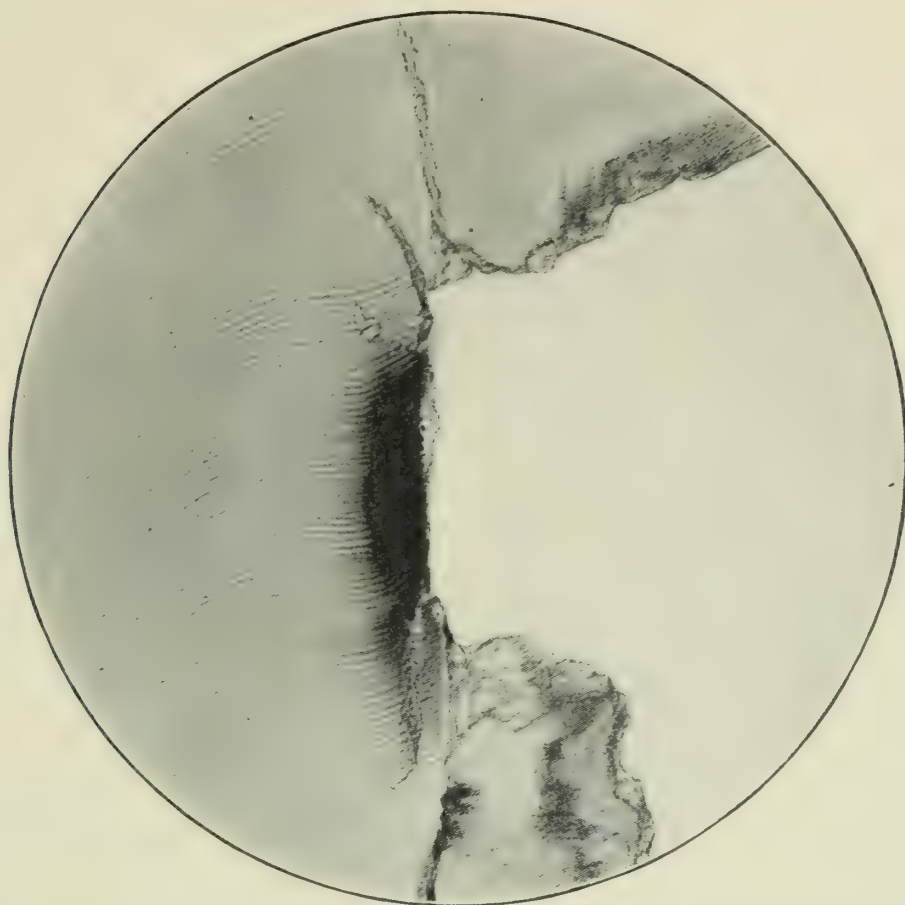
Within the last two years I have made a large number of sections from human teeth worn on plates, and the results which I obtained are in complete harmony with the view expressed in my "Micro-organisms of the Human Mouth," p. 159, and in the *Trans. Odontological Society of Great Britain*, 1896, p. 35.

till after the death of the pulp. We notice here the total absence of transparency except possibly an indistinct streak at *a*, which does not proceed from the decaying surface but from the external (approximal) surface, and which in all probability resulted from approximal decay during the lifetime of the pulp.

A great many other observations also point to the vital or non-chemical origin of transparency.

Where decalcification of the dentin

FIG 11.



Caries of tooth worn on a plate. Total absence of every trace of transparency. (50:1.)

FIG. 12.



Caries advancing from pulp-chamber and therefore occurring after death of the pulp. Absence of transparency. (15:1.)

takes place, as in caries, the process advances in a fairly regular line, so that if we remove the softened dentin from a cavity of decay we have a smooth, regular, concave surface. It is true we sometimes find the margin between the decalcified part and the dentin irregular and jagged, but never to such an extent as the inner border of the transparent zone. And in particular, we never find narrow bands or spurs of decalcified dentin extending quite to the pulp-chamber, as we see them in the transparent zone.

Where acid acts upon the dentin at any point, as in a fissure, we find the decalcification laterally as well as in the direction of the dentinal tubules, and in fact almost if not quite as rapidly in the former as in the latter direction. Should we not therefore expect to find the transparent zone, if due only to calcification, on the lateral margins as well as toward the pulp-chamber? As a matter of fact, in the great majority of the sections which I have examined, where the transparent zone is due to caries alone, I do not find it appreciably broader than the broadest diameter of the decalcified territory, and I think we may say that, as a rule, the transparent zone is wanting on the lateral margins.

We find typical cases of transparent dentin in places where the action of acids from without seems to be entirely excluded. Leaving the transparency of the roots of senile teeth out of account, we find transparency in cases where the enamel of the cusps has been worn down, even though the dentin may not be exposed thereby, and no trace of caries present. (Fig. 3, *a*.) I have seen a well-marked case of transparency in a molar in which the enamel of the approximal surface had been slightly worn away by friction against its neighbor.

TEST OF CHEMICAL ANALYSIS.

Chemical analysis does not give results which are consistent with the theory of decalcification. Some years ago I made an analysis myself and had another made by a Berlin chemist, Dr. Jeserich. Teeth were chosen with but a superficial defect in the enamel, and were split through the

defect and the pulp-chamber so as to expose the transparent cone of dentin. The latter was burred out with a very fine round bur, avoiding the parts next to the enamel margin where there was any indication of decalcification. The material was in each case obtained from about twenty teeth. The powder was treated with a magnet in order to remove any possible particle of iron, dried at 102-105° C. and the ashes determined. My analysis gave 71.9 per cent. ashes, while normal dentin from the same teeth gave 72.1 per cent.—a difference quite within the limits of the errors of experiment. Dr. Jeserich's analysis gave for transparent dentin 69.5 per cent., for normal dentin from the same teeth 68. These results do not indicate any decalcification.

Mr. Bennett rejects the significance of the latter analysis altogether, and concludes from the former that there is a decalcification in the transparent zone. His conclusion is, however, not at all warranted by the results. Anyone who has given attention to analyses of this kind must recognize the fact that a difference of 0.2 per cent. lies quite within the errors of experiment, especially where small quantities must be used for the analysis.

In the second analysis there is a difference of 1.5 per cent. in favor of calcification, which is not within the range of error of experiment; and taking both analyses together it is certainly demanding a great deal to expect one to find evidence of decalcification in them. Moreover I have already pointed out in my book on the "Micro-organisms of the Human Mouth," p. 162, that it is a wrong conception of the theory which I have adopted to account for transparent dentin to suppose that it is "compatible only with a high percentage of lime-salts." "A formation of new dentin, whether it be at the periphery of the pulp or in the domain of the fibrils, does not occur without a preceding solidification of the outer layer of the odontoblasts or fibrils. If, therefore, a new formation of dentin takes place in the tubules at the expense of the dentinal

fibrils, this occasions not only an increase of lime-salts, but also simultaneously an increase of the glue-giving basis-substance. We may therefore have a consolidation of the dentin, although analysis may not detect any marked increase in the percentage of lime-salts."

The action of coloring matters upon transparent dentin is not what we should expect if partial decalcification were present. It is well known that sound dentin does not readily stain with most of the dyes commonly in use, such as carmin, eosin, etc.; partially decalcified, on the other hand, it takes on stains very readily. I have found an aqueous solution of eosin a very valuable means of diagnosing the presence of slight decalcifications. If a drop of strong mineral acid (nitric, hydrochloric) acts upon ivory for a single second, a subsequent application of the eosin solution will immediately produce a bright red spot where the acid came in contact with the ivory. A minute drop of a 1 per cent. solution of acetic or lactic acid will bring about a sufficient decalcification in twenty seconds to cause a deeper staining with the eosin solution. So, too, we find carious dentin becoming deeply stained by eosin. If, now, transparent dentin represents a partial decalcification, we must expect it also to stain more readily than normal dentin. This is, however, not the case; on the contrary, we find the transparent dentin if anything even more difficult to stain than the normal.

The fact that we so often find a formation of secondary dentin in connection with the transparent zone, as exemplified in Figs. 2 and 13, although taken alone it cannot be said to prove that they have a similar origin, must still be acknowledged to point toward this conclusion.

All of these facts and observations must, I think, be granted as justifying the conclusion that typical transparency of the dentin, such as represented in Fig. 3, is a vital phenomenon which cannot occur in dead dentin, and which is brought about by the reaction of the living dentin against any external irrita-

tion, either of a mechanical or chemical nature.

There is one phenomenon still, connected with the transparent zone, to which I may hastily call attention. "We often find the zone of transparent dentin in beginning caries bordered on each side by opaque stripes which under the microscope appear almost black, and within which the tubules are seen to be filled with irregular, angular granules or rod-shaped elements. These opaque zones we find almost constantly in some way associated with the transparent zones, usually separating the latter from the normal dentin or filling out the space between the transparent zone and the pulp."

In many cases we find the opaque zone where we might expect the transparent zone; especially in the wearing down of teeth by mastication. Here we sometimes find transparency; more frequently, however, broad opaque zones, as in Fig. 13, *a*, or opaque and transparent streaks intermingled, as in Fig. 13, *b*. The appearances are such as to give rise to the question whether the opaque zone may not be a forerunner of the transparent zone. The fact, however, that we find transparency where there is but a slight abrasion of the enamel (Fig. 4, *a*), and opacity where it is completely worn away (Fig. 13, *a*), appears to point to the opposite sequence.

SECONDARY DECAY OF ENAMEL.

The thought presented above, that the action of the acids of decay upon dead enamel may be different from that upon living is also suggested by specimens of secondary decay of the enamel. A typical case is shown in Fig. 14, where the black inner margin of the overhanging enamel walls (which may be looked upon as dead) indicate an advanced stage of disintegration of the enamel. The acid appears to do its work very thoroughly as it advances, without penetrating the tissue deeply. The process very much resembles the artificial decalcification shown in Figs. 7 and 8. In Fig. 15 we have at the same time primary and secondary enamel decay, in which the difference

FIG. 13.



Increased opacity due to abrasion and associated with formation of secondary dentin. (10:1.)

FIG. 14.



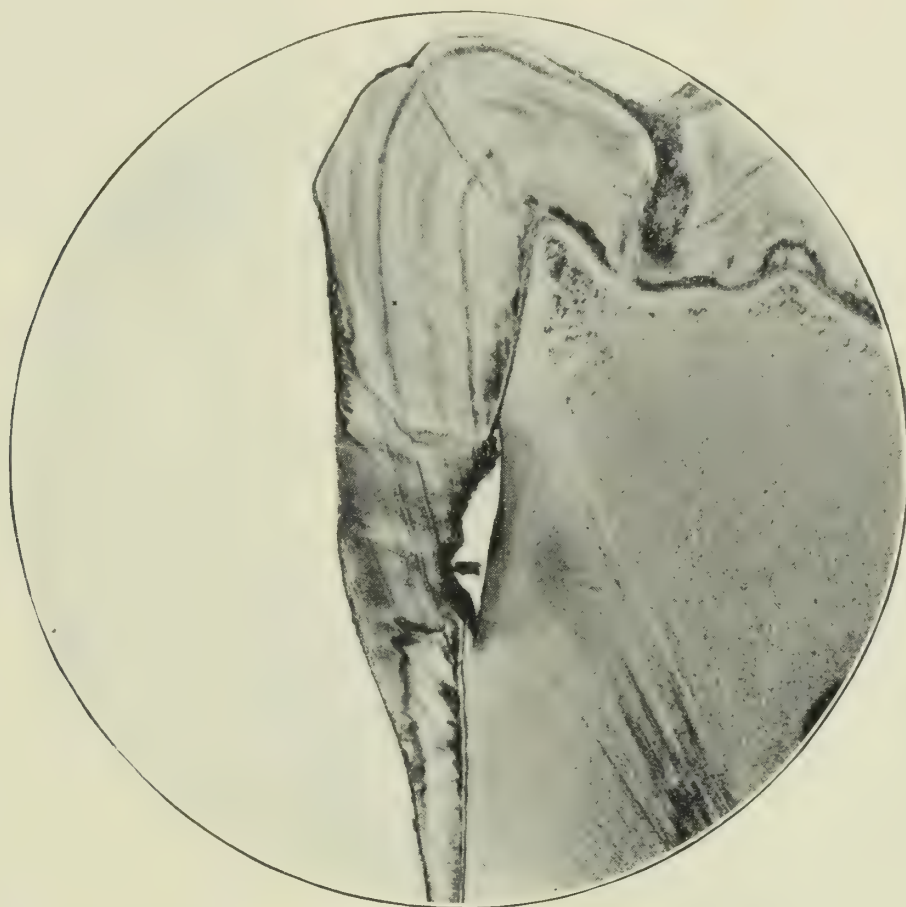
Secondary decay of enamel. The acid destroys the enamel as it advances. Apparent increased transparency of the enamel. (10:1.)

is distinctly marked. The primary has penetrated from without through the whole thickness of the enamel without producing any loss of substance; the secondary, acting from within, has produced only a very superficial decalcification, indicated by the black band, which is, however, accompanied by considerable loss of substance.

Undoubtedly a higher degree of concentration of the acids produced by fer-

tissue (see Fig. 14), and consequently present an appearance which leads one to inquire whether this may not be a phenomenon analogous to transparency of the dentin. If so, its presence in enamel which must be looked upon as dead, having lost its connection with the underlying dentin, must be considered as very significant. It is to be noticed, however, that it is wanting in primary caries of the enamel (*i.e.* caries proceeding from

FIG. 15.



Primary and secondary decay of enamel, showing marked difference in their character. (25:1.)

mentation will be reached in cavities of this nature than on the outer unbroken surface where the food is not so readily retained and where the diluting action of the saliva is more pronounced.

TRANSPARENCY OF THE ENAMEL.

Among my slides of secondary enamel caries I have a number which show a decided increase of transparency of the enamel on the margin of the decayed

the external surface) and that it occurs quite independently of caries. In the specimen shown in Fig. 14 we notice that it extends both on the right and the left side far beyond the limits of the decay. In the decayed portions it is rendered more prominent by contrast with the black carious margin. The examination of a large number of preparations has convinced me that it is quite independent of the changes produced by the caries.

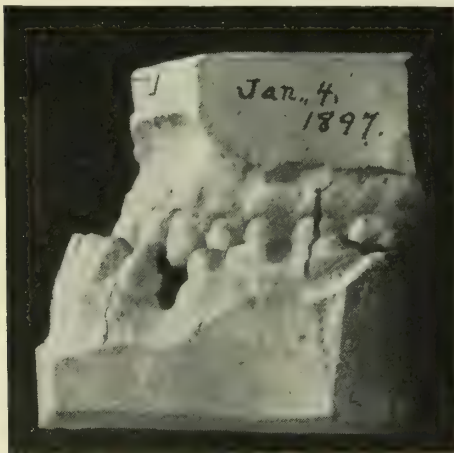
DOUBLE RESECTION FOR THE TREATMENT OF MANDIBULAR PROTRUSION.

By EDWARD H. ANGLE, M.D., D.D.S., St. Louis, Mo.

AT a meeting of the St. Louis Society of Dental Science held January 13, 1903, Dr. V. P. Blair, a surgeon of this city, reported and exhibited the case of an operation he had performed in December 1897, on a young man at that time a medical student, for the reduction of a greatly over-developed and protruding mandible.* This over-development caused great inharmony of the facial lines—amounting in this, as in all similar cases, to a pronounced deformity as to which the patient was keenly sensitive.

In January previous to the performance of this operation the patient had

FIG. 1.



come to me seeking relief through the correction of his malocclusion, at which time I took impressions of his teeth and made the models illustrated in Fig. 1.

The operation of double resection of the mandible for the correction of these exaggerated cases in persons of mature years had occurred to me as a feasible plan of treatment years before, for I had become convinced that orthodontia was almost powerless to work any consider-

able benefit in them, and that double resection, could it be successfully performed, was the only alternative. Since fractures—even severe comminuted fractures of both lateral halves of this bone—could be set and would firmly unite, it seemed that under the aseptic and most favorable conditions under which the proposed operation would be performed we might expect complete success, and I discussed the operation with the patient at this time. He decided to have nothing done then, but the following December Dr. Blair performed the operation, and, as before stated, reported the case and exhibited the patient before our society, composed of specialists in dentistry and medicine. It was to all the members, and especially to me, most gratifying to observe the firm, strong union of the ends of the segments of bone, and the most pronounced improvement in the lines of the face. All of the tissues involved in the operation were apparently entirely normal, and the pulps of the teeth uninjured. Even the scars resulting from the external incisions underneath the jaw were so very slight as to be wholly indistinguishable except on close inspection.

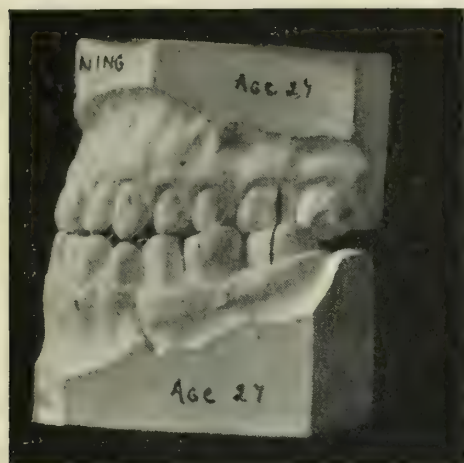
The result is very gratifying, and Dr. Blair is to be congratulated on so successful a termination of the first operation of the kind. Yet from the report of the case as published by Dr. James W. Whipple in the DENTAL COSMOS (July 1898), and from Dr. Blair's report before the above-mentioned society, I am forced to believe that with greater care in the technique of the operation we may hope for still better results. My interest in the future of this operation, as a complement to the science of my specialty—orthodontia—can certainly not be exceeded by that even of the surgeon, and

*See DENTAL COSMOS, July and August 1898; also *International Dental Journal*, October 1898, February, May, and August 1899.

this I offer in extenuation of the suggestions and friendly criticisms which I here wish to make.

In the first place, Dr. Blair stated that bandages, a submental plaster support,

FIG. 2.



and the wiring of the ends of the segments of bone together were in the main relied upon for support and fixation. A more crude and unscientific method could hardly have been employed. To make at least four additional wounds through the ends of the bone and soft tissues adjacent to the main wound, to be irritated by the slipping of the wire and to cause the complication of inflammation and finally of suppuration—and, above all, to by no means effect their purpose of holding the segments immovably and in correct apposition—is a method against which too much cannot be said, and those who will read the report of the case in the *DENTAL COSMOS* already referred to will find that just these complications did arise from the method employed, greatly delaying the natural process of repair, and causing a second pathological condition of serious proportions. That the ends of the segments of bone were not held in correct apposition is apparent even now, for an undue extent of surface of roughened bone can be plainly felt.

In the second place, the operation was not performed with a view of improving the occlusion of the teeth, but merely with reference to correcting the facial deformity; when to improve the occlusion, or to establish ideal occlusion, should be

the prime and essential motive in any operation upon the mouth or jaws which involves the teeth, and especially in this operation should it be made the first consideration, the facial lines naturally being improved in proportion as the ideal occlusion is approached.

Fig. 2 illustrates the models of the case which I recently made, and which represent the present condition. Fig. 3 illustrates the facial lines of the patient at the present time. It is to be regretted that the surgeon before performing the operation had not had a photograph taken showing the profile of the patient, that the great contrast in the facial lines might now be shown; but it will be observed that the lines of the face are now very good. By comparing Figs. 1 and 2 the extent which the mandible has been shortened can be seen.

It is very probable that upon the recovery of the patient the teeth occluded only on the points of a few cusps, but the present occlusion (shown in Fig. 2) has been artificially established by the

FIG. 3.



gold-capping of a considerable number of the teeth—a means of establishing occlusion which we believe to be as inadvisable as it is unnecessary when the operation is correctly performed.

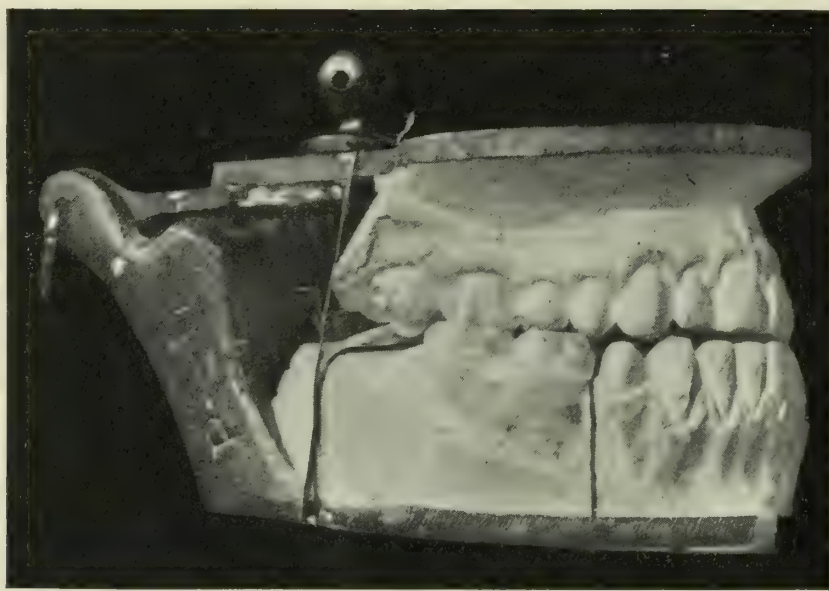
SUGGESTED TECHNIQUE.

Now, as occlusion is the governing principle for directing our efforts in this

operation, careful models should be made of the teeth of the patient from impressions most accurately taken in plaster. These models should then be placed in a metal articulator—one that has had a section of metal removed by sawing through the bottom of the false mandible from the front, distally, in order to allow the lateral halves to swing in. Then sections are made through the lower plaster model at the intended points of operation, and the ends of the segments shortened sufficiently to admit of the best occlusion practicable with the upper

tion of the body of the jaw I do not believe that anything more perfect or desirable for its support and fixation could be devised than a metal splint swaged over a metallic die made from the reconstructed plaster model (or the splint might be made from vulcanite or Watt's metal), but in any case it need not cover more than the crowns of the teeth. It should be loose-fitting and should also be freely perforated with holes on the occlusal surface for the free escape of all surplus cement used in cementing it upon the jaw after the segments of the

FIG. 4.



model. Fig. 4 shows an exact duplicate of the model shown in Fig. 1 which has been so treated. It will be seen that this is probably as good occlusion as could be gained by the operation, but later a slight modification of the cusps of the molars by grinding (which is anticipated) would bring more of the occlusal planes in harmony. The teeth would then be in very good occlusion, and in great contrast with the result obtained by the plan followed by the surgeon, as shown in Fig. 2.

Having determined the proper degree of reduction and the best obtainable occlusion, the segments of the reconstructed model are cemented together with thinly mixed plaster of Paris, applied into the spaces from the lingual side with a fine camel's-hair brush. If the sections are made in the anterior por-

bone have been brought into apposition.

The teeth of the patient having been thoroughly cleaned and the splint made as directed, the next step would be the surgical removal of the sections of bone; but it must be remembered that unless these are of the proper size and shape, the ends of the segments of bone cannot be brought into proper apposition and the splint will not fit at the critical time. But the size of the sections to be removed can be determined with great accuracy if the following plan be observed:

If the models be made with that skill which is easily possible, the minute stipples and markings of the gums will be accurately shown on their labial and buccal surfaces; and at one end of the anterior segment of the reconstructed model, in the region of the gingiva, one

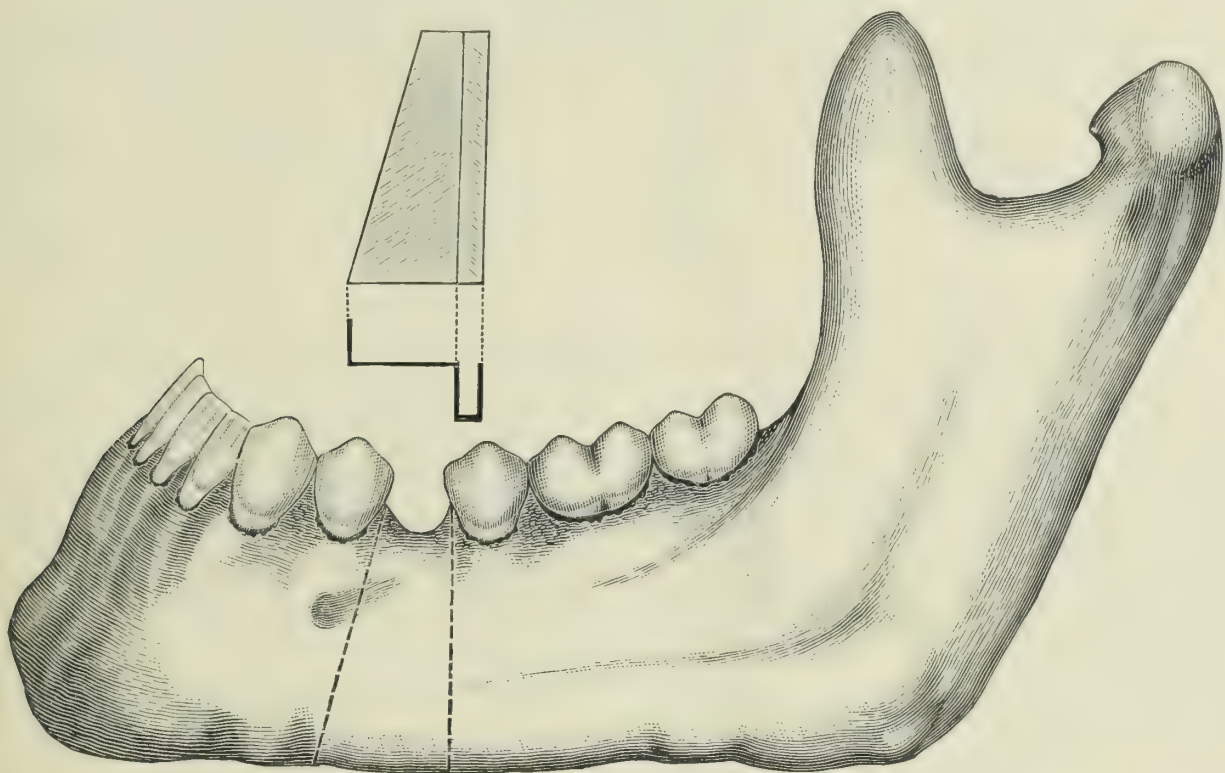
of the stipples is noted, and this same one at the same point on the second, uninjured model is also found and indicated with a sharply pointed pencil. By again referring to the end of the same segment—only, say one-fourth of an inch farther down—another minute point or stipple, probably half severed by the sharp blade of the knife when the trimming to adjustment in the articulator was made, is found, and its duplicate on the uninjured model is also located. If now a straight line be made from top to

a metal pattern is made corresponding to the size of the section indicated on the plaster model, and having projections of metal soldered to its mesial and distal edges which shall project at right angles in opposite directions, one of them re-curved upon itself to form a groove into which shall play the back of the saw, as shown in Fig. 5.

TECHNIQUE OF RESECTION.

After proper incisions have been made for the passage of the saw through the

FIG. 5.



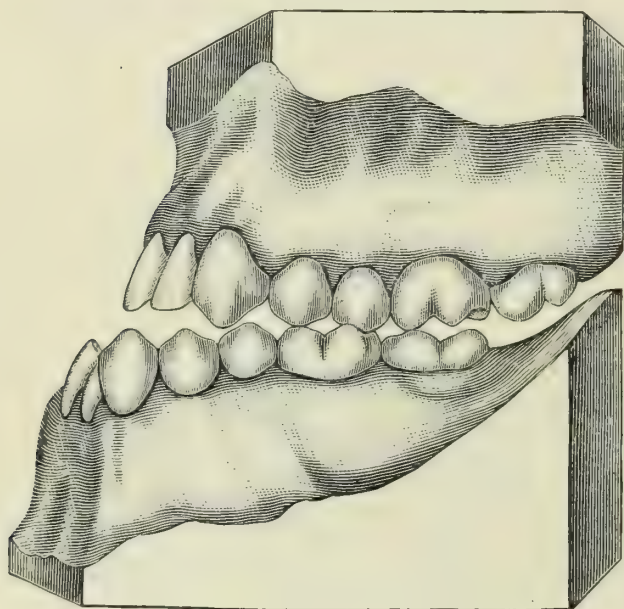
bottom of the uninjured model through the points indicated, we will have one fixed line. In like manner points are found at the end of the lateral segment and are also re-located on the uninjured model, from which the second line is determined, as shown in Fig. 5. This will show the form and extent of the section which has been removed in the whittling away of the plaster to gain correct occlusion in the articulator, and also the form of the section of bone that must be removed in order that the occlusion, fit of the splint, and apposition of the ends of the bone shall be correct.

To insure the correct location and direction of the cuts to be made by the saw,

soft tissues, a cut is made with the saw at a previously marked line upon the gum at the proper point, and the bone carefully sawed into to the depth of an eighth of an inch or more. The pattern is then inserted and the flange on the under side of the same made to engage this cut. The pattern is firmly held in position and the saw inserted in the groove at the other end of the pattern, and the second cut made, nearly, but not quite, through the jaw. The pattern is then removed and the first cut deepened with the saw to the depth of the second cut. The other side is then treated in like manner, according to a similarly made pattern for determining the size of

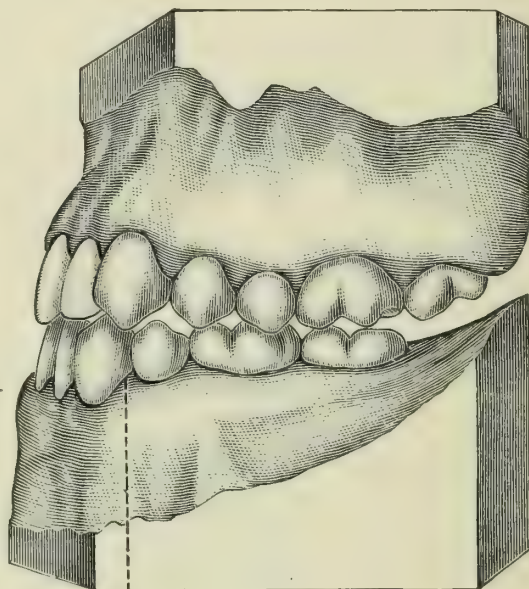
the section on that side. Then the final cuts with the saw are made, the sections removed, the segments brought into apposition, and the splint adjusted.

FIG. 6.



gum as far as possible without impinging on the cheek muscles, in the region where the incisions are to be made. It is then removed and sawed through where the

FIG. 7.



THE SECTIONAL SPLINT.

A second plan, which offers some advantages over the first, is also here offered—one which reduces the operation to a great simplicity and accuracy:

A model of the lower jaw, as shown in the illustration, Fig. 6, has been reconstructed in the metal articulator to the best practicable occlusion, as shown

anterior cut of the section is to be made, as indicated by the dotted lines in Fig. 8. The ends of the segments are then stiffened with half-round wire, and small metal buttons are soldered to the plate near the stiffened ends, as low down and as high up as possible, both buccally and lingually, as shown in Fig. 9. Suitable holes for the escape of the surplus cement

FIG. 8.

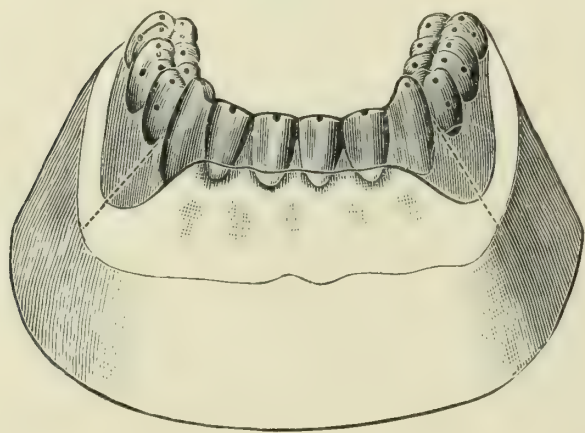
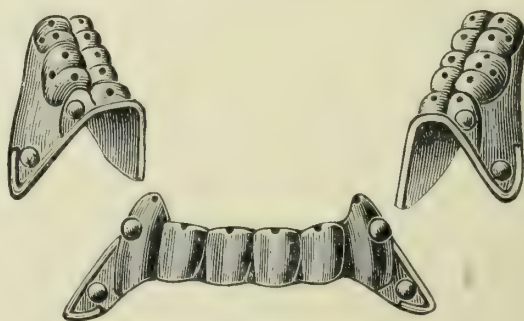


FIG. 9.



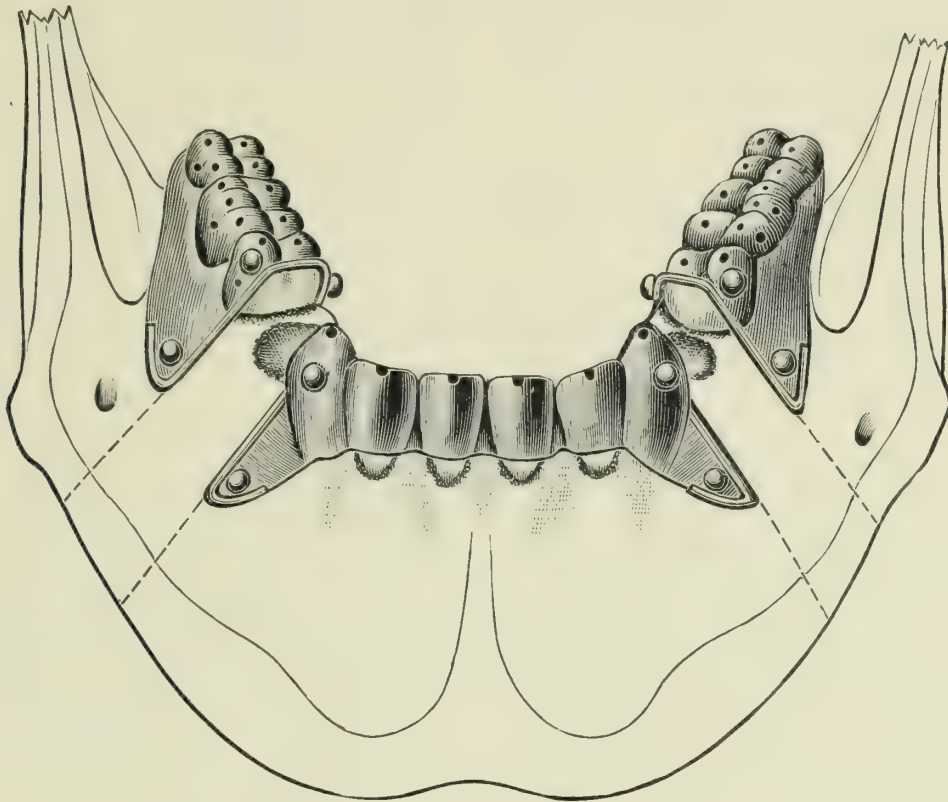
in Fig. 7. This model is then duplicated in suitable metal, and over this, with counterdies a metal plate is swaged, preferably of silver, as shown in Fig. 8. The plate is allowed to extend down upon the

are made in various parts of the plate, the patient's teeth are thoroughly cleansed, and all three segments carefully cemented upon the teeth, as shown in Fig. 10. Then at any convenient time the sections can be removed from the mandible, the ends of the plate offering

excellent guides for the blade of the saw. After this is done the segments of bone

sumptuous experimenters. Neither is it an operation that the surgeon, no matter

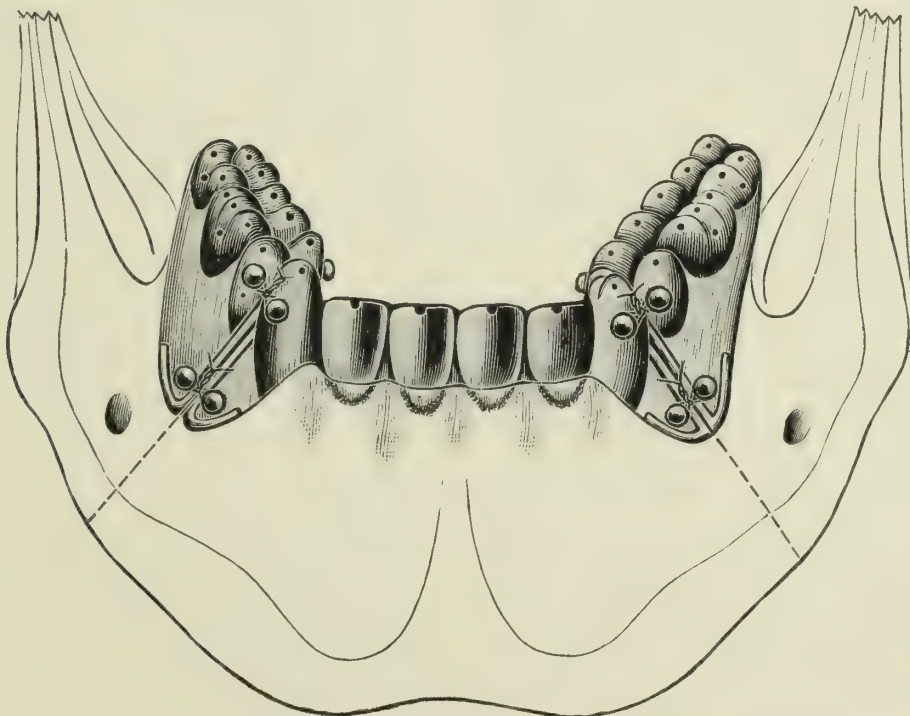
FIG. 10.



are brought into correct apposition and firmly held by wire ligatures wrapped about the metal buttons, as in Fig. 11.

how broad his knowledge nor great his skill, has any right to perform by himself with the fossilized methods at his com-

FIG 11.



In concluding I would say that this is not an operation for irresponsible, pre-

mand for securing jaw-fixation. He has not the knowledge nor the conveniences

for either making or adjusting the requisite devices, nor is it to be presumed that he has or should have. Neither is it an operation that the dentist with his meager knowledge of surgery has any right to undertake by himself, but the

intelligent surgeon and orthodontist or dentist should meet, and by their skill and co-operation perform this operation, which offers such great promise of benefit to those so seriously handicapped by these pronounced deformities.

THE "A B C" OF CROWN AND BRIDGE WORK.*

By **FRED. A. PEESO, D.D.S., Philadelphia, Pa.**

(Continued from page 185.)

PYORRHEAL CONDITIONS.

THESE are the most troublesome conditions with which the dentist has to contend and also the most uncertain as to the result of his endeavors to effect a cure. The successful treatment of pyorrheal trouble depends on general as well as local conditions, and must be dealt with accordingly.

A sickly person, or one who is physically run down, is not in a condition to withstand the ravages of this or any disease condition as is one who is in perfect health. This affection may be caused by some external irritation and its severity depends largely upon the physical condition of the patient, the pus resulting from the inflammation of the tissues forming the best medium for the culture of micro-organisms.

Where the trouble is deep-seated, there is probably a constitutional weakness, or some loss of vitality, which renders the patient unable to successfully resist the encroachment of the disease, which keeps working its way deeper and deeper, until finally the teeth loosen and fall out. Where the patient is constitutionally strong, the disease may not be able to penetrate much beyond the immediate vicinity of the irritated area, and in this case the chances of effecting a cure are much better than in the other. In the first named condition, local treatment alone will not be effective, but must be

accompanied by systemic treatment as well, to tone up the system and create healthy blood, which will assist in overcoming the disease and in destroying the organisms which have caused the trouble. In extensive troubles of this kind it is as well to refer the patient to a specialist.

It is not the intention of the writer to enter into any extended dissertation on the cause or the treatment of this or of any disease, but to speak of them only as they are directly connected with the prosecution of crown and bridge work, and to describe the methods which have proved most effective in his hands.

The local treatment of pyorrhea alveolaris, or conditions resembling that disease, is at the beginning largely surgical or mechanical. In the first place, it is necessary to scale the roots and remove every trace of tartar or serumal deposits from around them, and this must be done thoroughly in order to be effective.

Many different instruments are made for doing this work, and most of them are good. Some of those especially designed and known as pyorrhea instruments are excellent, such as Allport's set of fifteen, Tompkins' set of eleven and Younger's set of twenty-seven. With these instruments there is almost no part of a tooth or root that cannot be reached, but an instrument which in the hands of one operator would be ideal

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might not suit another at all. Any instrument may be used that will do the work—scalers, excavators, or anything to reach the spot.

After the parts are thoroughly cleansed, they should be washed well with a solution of glyco-thymolin, listerine, or some other good antiseptic, and the patient given a wash of the same, with instructions to use it persistently. If at the expiration of a few days there are not marked signs of improvement, more extreme measures should be resorted to. The roots should again be scaled to make sure that nothing of an irritating nature was left at the previous treatment. Hydrogen dioxid three per cent. should be injected under the free margin of the gum and into the pockets, if any are present, using the bulb syringe, with the platinum point forced as far up under the gum as possible. This should be kept up as long as there is any trace of pus, and as soon as effervescence ceases it should be followed with aromatic sulfuric acid, injected in the same way, and the mouth immediately rinsed with a strong solution of sodium bicarbonate. The patient should be instructed to continue the use of the glyco-thymolin or other antiseptic mouth-wash, using it frequently, holding it in the mouth and flushing the teeth and gums well. Should there be no evidence of improvement after repeated treatments, it is best to exclude the tooth or teeth as possible abutments for crowns or for bridge work.

Very often, where the trouble is not deep-seated or aggravated, most excellent results are secured by cleansing the teeth thoroughly and packing quinin sulfate under the free margin of the gum around the necks of the teeth. This has a stimulating effect and will tend to tighten the teeth in their sockets. The only objection to its use is the bitterness of the drug, as the taste will remain in the mouth for several days after it has been applied; but that is only a minor point and should not deter the dentist from using it if it will bring about the desired result.

Good results are claimed for glyco-

thymolin alone in the treatment of this trouble. Trichloroacetic acid worked carefully under the gum with a piece of orange-wood is effective in softening any tartar which may remain after scaling, and stimulates the disturbed region.

TREATMENT OF PUTRESCENT PULP-CANALS.

In the treatment of conditions of this order, success means thoroughness as much as in any other part of the work. When the pulp of a tooth has become devitalized from any cause, if it is not removed at once and the canals filled, it is almost certain to bring about serious disturbances at some future time. It may go on for years without the least inconvenience on the part of the patient, or without his being aware that the pulp is dead, but sooner or later he is likely to hear from it to his sorrow.

Where there has been any inflammation or pain in the surrounding parts, occasioned by septic matter or gases from a putrescent pulp, the treatment should be practically the same as for alveolar abscess, as there is probably a formation of pus, and it should be evacuated by making an opening through the process and treating it in the manner described in the previous article. Where the irritation has been but slight, and very recent, it can generally be cured without resorting to extreme measures. Where there has been no pain whatever, one thorough treatment is generally sufficient; the question must, however, be decided in accordance with the existing conditions of each individual case.

In the first place, the canals must be thoroughly cleansed with broaches and drills as directed in speaking of the treatment of alveolar abscess. They should be well enlarged, so as to cut away as much of the infected dentin as possible. Where a pin is to be used, the canal should be enlarged to the full size at once. Great care must be taken, in doing this, to prevent any septic matter from being forced through the apical foramen, as this would be almost sure to

set up an inflammation which would result in alveolar abscess. When the roots are cleansed, they should be well washed out with three per cent. hydrogen dioxid. The canal should then be dried with bibulous paper or absorbent cotton, wiped with alcohol and thoroughly dried with hot air, after which it can be sterilized. Formalin is one of the best agents that can be employed for this purpose, but in using it the dentist must be extremely careful, as the action of this drug on the soft tissues is very irritating and if great care be not exercised in its use the effect may be disastrous. It should never be sealed in a root-canal, especially if the apical foramen has not been perfectly closed. An excellent method of sterilizing with formalin is, after drying with alcohol, to wind a wisp of cotton around a broach and dip it in the solution, which may be anywhere from four to forty per cent. in strength according to the severity of the case. The broach is then touched on the towel to take up the excess and the canal wiped out with it and thoroughly dried with hot air. This can be repeated until the canal is thoroughly sterilized. The evaporation with the hot air drives the vapors of the formalin through the dentinal tubuli until every part of the tooth is reached. The apical foramen should then be closed at once. Frequently a slight tenderness will be manifest for a day or two, but this will soon pass away unless an excess of the formalin has been used.

In sterilizing with carbolic acid or other drugs, the process is longer and requires more frequent visits on the part of the patient for treatment, besides being more uncertain as to the result. After drying with alcohol, a dressing of carbolic acid, potassium permanganate, or whatever drug is used, is packed in the canal and the cavity sealed with gutta-percha. This is repeated at the next visit, and so on until the desired result is obtained. Where there has been slight irritation in the apical region it is well to enlarge the apical foramen slightly and employ the latter method, leaving the foramen open until the irritation has

passed away, and then filling it at once, after which it is not a bad plan to use the formalin in the manner already described, to make assurance doubly sure.

In those extreme cases, of years' standing, where the entire tooth-structure has become so impregnated with putrescent matter as to be discolored and black, and a foul odor arises from the cutting of any part of the tooth or root, it is as well to extract it if there be any other available tooth that can be used in its stead. Where such a tooth has to be used, the operator should by numerous treatments endeavor to bring it to the best possible condition. It is not often that a tooth is so far gone but that there is some hope of saving it.

It may happen that a tooth-pulp will be found to be devitalized or the canals may be empty, or the pulp in a mummified condition, with no perceptible odor coming from it. In teeth of this description the canals should be cleansed and sterilized just as though the pulp had been in a putrescent condition. The same may be said of teeth in which the roots have been filled with cotton. In any of these cases, the roots should be filled immediately on the conclusion of the treatment.

FILLING OF ROOT-CANALS.

In the filling of pulp-canals, it is not so much the materials which are used as the manner in which they are inserted. Among the best of the materials which are used for this purpose, are probably gutta-percha and zinc oxychlorid. One of the best methods of filling with gutta-percha is as follows. The rubber dam should be used whenever it is possible to do so:

After the canal has been thoroughly cleansed and dried, take a gutta-percha point of a size corresponding to the size of the canal to be filled, and fasten it to the end of a canal plugger by heating the point of the instrument. Then introduce a little eucalyptus into the canal with the points of a pair of cotton pliers, or with a wisp of cotton twisted around a broach. The gutta-percha point is now

dipped in eucalyptus and then the tip of it in iodoform or aristol, after which it is introduced into the canal and worked in with a pumping motion, carrying it farther up as the oil softens the gutta-percha until it becomes loosened from the plugger and is pressed firmly into place. In this way the canal can be thoroughly filled all the way to the apex. It does no harm if the patient winces during the operation, as that is a pretty good indication that the end of the root has been reached.

Chloroform may be used in the place of the eucalyptus, introducing it into the canal by means of the hypodermic syringe and working the point in in the same way, the chloroform dissolving the gutta-percha so that it can be carried all the way to the apex. The use of the oil of eucalyptus is preferable, however, as it is of a healing, soothing nature, besides being antiseptic, which quality it will retain for many years. Of course, if the foramen has been enlarged, care must be used not to force the filling through, as already described in treating of amputated roots. Where the canal has been enlarged to receive a pin, a short thick point is attached to the end of the plugger, dipped into the eucalyptus and iodoform or aristol, and forced to the apex, packing it tightly against the shoulder left by the reamer.

In using chloro-percha as a filler, a little iodoform or aristol is first put in the canal, and then the chloro-percha is carried in, pumping it with a broach and adding a fresh supply of the solution as the chloroform evaporates. When it is carried well into the canal, fine wisps of cotton can be packed in with a very small plugger until the canal is filled. This makes a good filling, but it is a question whether it will make one as perfect as the gutta-percha point, especially in the upper teeth.

In filling with zinc oxychlorid the material can be used in the same way as the chloro-percha, and it makes an excellent filling, but it has the disadvantage of being very hard to remove, if at any future time it should be desirable to re-

move the filling from the canal in order to insert a pin for a crown or as a support for a bridge.

When the canal is enlarged, but not the foramen, gold will make a good filling for the apex. A little soft gold foil is rolled carefully around the point of a broach and carried well to the end of the root. The broach is then turned in the opposite direction, to loosen it from the gold, and removed, and the filling packed tightly in the apex, filling the foramen perfectly.

Paraffin may be used in some instances. A little iodoform or aristol is first put in the canal and then the paraffin is carried in with a fine, heated broach. This makes a very good filling and will fill the root very thoroughly if a little care be used.

THE TREATMENT OF PERFORATED ROOTS.

This is a trouble all too frequently encountered, and one which is often very puzzling to the dentist. The treatment, however, in most cases, is very simple and easy. In cases where the perforation is at the apex of the root, it can be treated and the root filled in the same way as an abscessed tooth where the foramen has been enlarged. If there has been much inflammation, a dressing of eucalyptus oil and iodoform or aristol should be kept in the root until the soreness has passed away, when the foramen can be filled in the manner already described. Where a long time has elapsed from the time the perforation was made, the root is almost certain to be abscessed, and the case would come under the head of alveolar abscess.

When the perforation is at the side of the root it is more than likely that the soft tissues have grown into the cavity. This tissue can be removed by excision or may be cauterized with carbolic acid, trichloroacetic acid, or iodine. Where the growth is not great the opening may be cleared by packing the cavity tightly with dry absorbent cotton. This, as it becomes moist, will swell and force the gum out through the opening. The sides of the opening should then be grooved or

roughened to hold the filling in place and the cavity wiped out with adrenalin chlorid. If the perforation is not much below the gum margin, it often happens that a small, flat-ended instrument can be passed under the gum and up the side of the root so as to cover the opening. This is now thoroughly dried with alcohol and hot air, and the filling is packed tightly against the instrument. In this way there is no danger of an excess being forced through into the tissues to keep up an irritation.

Where the perforation is so far beyond the gum line that it is impossible to cover it, it is well to first force a little base-plate or high-heat gutta-percha into the opening and then remove it. This will show its exact size and shape and the amount of filling material that will be needed to close it. If gutta-percha is to be used the trial plug can be trimmed so that it will come not quite to the outside of the root and leaving a slight excess on the canal side. The adrenalin chlorid will prevent bleeding or moisture from oozing into the cavity, which should be dried with alcohol and hot air and then wiped with eucalyptus, or one of the essential oils, such as the oil of cinnamon, cajuput, or cassia. The plug, which has previously been lightly fastened to the end of an instrument, is then packed into the opening, flush with the walls of the canal.

Copper amalgam probably forms the best filling material for cases of this kind. In the case just described the trial plug will show the amount which it will be necessary to use, and the amalgam is packed into the opening, care being used not to force it beyond the outer wall of the root. It is better that it should not go to the outer wall of the root rather than that it should extend beyond it.

Where there is a large perforation in the pulp-chamber, it is best to cover it with a piece of thin, soft platinum, or tin, before inserting the filling. Here may be briefly described the manner in which the upper right first bicuspid root was treated where the pin of a crown had been inserted between the two roots (the

case referred to in the preceding article, page 183): The two canals were first opened to the apex and enlarged for a short distance beyond the floor of the pulp-chamber so as to take a pin of about No. 16 or No. 17 gauge, and two pins of brass wire were fitted tightly in place. (Fig. 39.) A piece of thin, soft plati-

FIG. 39.



num. was then burnished over the floor of the pulp-chamber, a little more than covering the opening, as in Fig. 40. It

FIG. 40.



was then removed, together with the pins, and the opening between the roots wiped with adrenalin chlorid to keep blood or moisture from entering the pulp-chamber, which was then dried with alcohol and hot air. The pins were then slightly coated with cacao butter (but vaselin or olive oil can be used instead) to prevent the cement from sticking to them, and again inserted into the canals. The platinum cap was replaced over the perforation in the pulp-chamber, which was then filled with zinc oxyphosphate packed tightly in the chamber and around the pins. After the cement had hardened, the pins were removed, leaving the canals open all the way to the apex, and the tooth was treated in the manner described.

Where there has been a considerable injury to the process, with great irritation, and a long time has elapsed from the time the root was perforated, it may be impossible to save it, but much may be done for a badly abused tooth with care and patience on the part of a skilled operator.

It is well not to be in too great a hurry to extract a root that has been

perforated. It should be studied carefully, and if it can be saved the dentist has not only rendered his patient a great service, but he has the feeling of satisfaction and pride which comes from having overcome a serious obstacle and which more than repays him for his trouble.

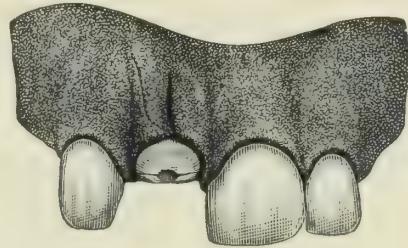
WHAT SHALL BE DONE WITH FRACTURED ROOTS?

This is often a very vexing problem, the solution of which is apt to give the operator a great deal of trouble. Every dentist is sometimes called upon to decide whether a root which has been split can be saved or will have to be extracted. It is a condition frequently caused by crowning a root without banding it, and is most often met with in the incisors and bicuspid. In the majority of cases where there is a bad fracture it will be necessary to remove the root, but sometimes it can be made to do good service for a number of years, even if it be split all the way to the apex. A case which presented several years ago will illustrate one way in which this trouble was overcome:

The patient was a young man about twenty-one years of age. A Logan crown had been placed on the upper left central root, but the strain was so great as to split the root to the apex, allowing the crown to fall out. As a first step the gum was slit on the labial side, to allow

a piece of wire to be placed around the root, forced up to the alveolar process, and twisted until the parts were drawn tightly together. (Fig. 41.) The end

FIG. 41.



of the root was then trimmed for the reception of a band, but more tooth-structure was taken away than would ordinarily be done. A narrow iridio-platinum band was then fitted and cemented to the root, and the wire was removed. The root was then treated as though it had been sound. Another band was fitted over the one of iridio-platinum and a Richmond crown made and inserted, which at last accounts was doing good service.

In many cases where there is only a minor fracture the part which is broken away can be removed and the band carried up beyond the break; but this will be treated of when we come to take up special cases. As in the case of perforated roots, the dentist should not be in too great a hurry to extract, but should wait until he has exhausted every means in his power to save the tooth.

(To be continued)

LEWIS ROOT-IMPRESSION AND SWAGING CUPS.

By CHARLES B. LEWIS, D.D.S., M.D., Des Moines, Iowa.

(Read before the Iowa State Dental Society, at its annual meeting, Des Moines, Iowa, May 6, 1902.)

THESE instruments, two in number, are made to fit cone-socket handles. The larger is for use in taking impressions and fitting metal plates to the roots of central incisors, canines, and large laterals. The smaller cup is to be used for small laterals, deformed teeth,

or those which may be irregularly spaced. The impression material may be modeling compound, plaster of Paris, cement, or any substance which will become hard after the impression is taken. Compound is usually preferable.

To secure the impression prepare the

root for the crown to be mounted, reaming out the canal to allow for the pin. Fill the cup with compound, shaping it in the form of a cone, as in Fig. 2. This insures spreading of the soft tissue and prevents the gum from folding in ahead of the compound and marring the impression when the cup is pressed to place. The cup should be held steady and forced up far enough to get an impression of the root but not so far that the cup itself

FIG. 1.



FIG. 2.



strikes. Sufficient body of compound must be left to insure strength. After removing the impression, trim away the excess compound according to the line showing the margin of the root. You can now take a wire measurement of the impression if a banded crown is to be mounted, and proceed as usual.

Following, however, is the description of a crown that will be found more satisfactory in the majority of cases than the banded crown:

Prepare the root as in Fig. 3, beveling underneath the free margin of the gum with a root-facer. Ream out root-canal to No. 16 gauge iridio-platinum wire. Secure and trim your impression. Take a piece of No. 29 gauge pure gold and force the pin of the instrument through it and trim according to your impression,

as in Fig. 4, at "1." Place the instrument on the root and swage the pure gold to place and complete the trimming.

FIG. 3.

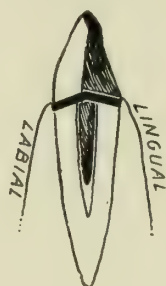


FIG. 4.



Now solder in a No. 16 iridio-platinum pin and back and mount the porcelain facing in the usual way, and flow with

FIG. 5.



22-k. gold solder. The completed crown is shown in Fig. 5. Fig. 6 illustrates the steps. Care is essential to success in this as in any other crown.

FIG. 6.



A few trials will enable the operator to become quite expert in the use of these instruments, and they will be found valuable as time-savers. It is possible to adapt a crown by this method practically without any pain to the patient. Two other cups have been made, with pins shaped like Logan pins, and these can be used if a Logan crown is to be mounted on the metal plate instead of a facing.

QUALIFICATIONS FOR PRACTICE.

By ARTHUR HOLBROOK, D.D.S., Milwaukee, Wis.

(Read before the Milwaukee Odontological Society, February 10, 1903.)

IN a paper presented to this society three years ago, entitled "Sixty Years in Dentistry," I called attention to the fact that dental colleges were not giving practical encouragement to a preliminary preparation or training beyond the required two years in a high school. So far as I am able to learn, that condition continues, although some dental schools have independently increased the entrance requirements to three years' high-school work or its equivalent.

It is immaterial to the purpose of this paper whether the entrance requirements have changed or not, or whether the prescribed dental school course is three years or four years. The one main point I have in view is, Are dental schools doing all in their power to encourage the highest preparation and the highest ideals?

The cry is continually heard from every dental quarter that dentistry is one of the great and learned professions, and that it offers to educated men a field as open and promising as any of the leading professions. Possibly this is correct. But what makes a profession learned, great, and strong?

It is possible that a dental school is able to take a boy at the age of sixteen, from his second year at high school, and in four years fully equip him for the practice of dentistry, so that by the time the student has reached the legal age for voting he can open an office and begin work. But is this the proper course for advancing the higher interests of the individual and the higher interests of dentistry? It is this particular question that I desire to ask this evening, and it will be my earnest endeavor to impress its importance and its bearing upon the future of dentistry.

Dental schools do not say, or believe, that an education beyond the second year

at high school is unnecessary; but are they not encouraging that idea and belief in the minds of boys of sixteen, who are at their most impressionable age, when they ask these boys to leave school in the midst of their work, virtually saying that any further high-school work, and indeed any further education, training, or preparation is superfluous for entering a dental school, as no material credit will be given to any applicant beyond the advertised standard requirements?

Is this encouraging a further preparation, and tending to the attainment of higher ideals? If the country were actually suffering for lack of dentists there might be an excuse for inducing boys to study dentistry, but it is well known that no such emergency exists. Dentists are not only superabundant, but they are multiplying at a greater rate than are lawyers, doctors, or the members of any other professional calling. So far as I am able to learn, there is no necessity, immediate or prospective, for taking boys from the high school to study dentistry, unless it be the pressing necessity of dental schools for students. Dentistry is frequently cited by enthusiastic practitioners as not only a learned profession, but a liberal one, and there seem to be just grounds for calling it liberal. Dental schools are certainly liberal in their inducements to enter dentistry.

One who has come to manhood, who has graduated from the highest ranking college in the world, who may also have attended postgraduate courses and have reached the highest attainments, and been honored with *cum laude* degrees, on entering a dental school must rank with the boy who is six or more years behind him in educational work.

Let it be distinctly understood that these unequal attainments are not cited

to the discredit of the high-school boy, for it is well known that an early application to a life-calling is often—far too often—forced upon those who are not able to longer continue school work, and who must begin life's battles at an early age. Neither is it the intention to question the right of any dental school to adopt standards for entrance. It is my purpose, however, to question the methods of dental schools regarding the practical encouragement they are giving to higher education.

I am familiar with the explanations usually made by dental educators for this condition, for I have heard them frequently, and have read them, from some of the most distinguished men in dental school work. Their statements that "The educated man has an advantage over the other; that he not only has a broader foundation, but that he will have more time in a dental school for the 'technique' and practical," may be very assuring, but it is very depressing to the man who places a value on brain-work. The further statement from some of these educators, that their school has gone beyond the minimum entrance limit, and has dignified itself by exacting a three years' high-school course from all applicants for admission is a very encouraging sign, for it leads to a hope that there may sometime come a better understanding of the needs of our profession.

THE FACULTIES STANDARD.

At present the minimum entrance requirements are established by a National Association—or, in other words, by a combination of dental schools, high and low, rich and poor together; and so long as that association decrees that all schools must adhere strictly to the rules governing not only entrance requirements, but also those which positively prohibit giving advanced standing to any person whatever for previous training, ability, or experience, just so long, in my humble opinion, will trained and educated men hesitate to enter a dental school and will turn to other vocations. I have not inquired of dental schools the percentage of their pupils who have com-

pleted a university or scientific course. I venture, however, to assert that it is very small. In contradistinction to this I venture that medical and law schools will make a much larger and more favorable showing of college men among their students.

One cause for this may be found in the fact that the fields of medicine and law are broader, giving greater range to mental activity and a larger field for operation. Dentistry, while it has a field entirely its own, is only a specialty, and does not appeal to the educated man who has a "broad foundation" and desires to utilize it to the greatest advantage. But there are educated men in dentistry, and to their untiring perseverance is due all the profession can boast of to-day. If they can be spared to carry their work through another decade we will hope for better days for dental science and art. These men need the help and encouragement of every true dentist.

To one who has watched the development of education in dentistry and compared its history with that of preparation for the sister professions of medicine and law, it is evident that dental schools are now in what may be termed a transitional condition. They are getting away from the old conditions, and are planning for a new condition, where the entrance requirements will be so high as to insure that every man who graduates in dentistry will be a thoroughly prepared man, a man educated not only specially and technically for dentistry, but one who will be broadly prepared for a place among men.

Dental schools are of recent date. Medical and law schools have existed from time immemorial. It is not to be expected that this younger profession will mature its work in a half-century and that dental schools will have attained a permanent basis in that short time. There are hundreds of little questions, and scores of vital ones, that must be met and solved before the evolution will be complete, but the time is certainly coming when dental schools will stand for, and will enforce, high ideals. In my opinion this transitional stage has

reached a point where something practical, definite, and encouraging ought to be done for those who have continued their work beyond the present dental school requirements, and who have entered the broad field of learning for learning and manhood's sake. It is true that dental schools can impart information, and in four years declare the student a dentist, but is this all that is essential for a practitioner of dentistry in this progressive age?

If dental school graduates who entered from an unfinished high-school course would return to complete their general educational training, dentistry might advance along that line, and dental educators have advised that course; but such a course does not appeal to college men and will never obtain. There are other things in life besides dentistry, and if the profession of dentistry is to advance to high ideals it will be obliged to encourage the development of the *man* who is back of the dentist.

RECOGNITION OF THE COLLEGE GRADUATE.

This has been impressed upon me very forcibly during the past few years. Young men and their parents have come to me for advice regarding the practice of dentistry. Some of these cases appealed to me strongly, for I realized that the profession would be helped by the addition of educated college men. But when these young men learned that dental schools would give them no practical credit for their college work, and would demand attendance upon a full course of four years, their enthusiasm for dentistry quickly subsided. They did not expect full credit, but they did expect some practical recognition of the extra six years' time and work of preparation.

This situation is generally unexpected by college men, for, as a rule, men attending strictly to their work at college do not take the time to consider their life-vocation until they are in their last college year and the approaching graduation forces the query, What next?

They have been working for a foundation for the future, supposing a good

education to be one of the primary necessities of every calling and profession, but to their amazement they learn that it is not required for dentistry as interpreted by dental schools. Only an immaterial credit will be given for work or courses which the discretion of a professor may consider as parallel or equal to his own, but which will not lessen time or attendance. This condition suggests further thought as to the best or most satisfactory age for selecting a vocation. The inducements offered by dental schools indicate about the age of sixteen as the most suitable. Do facts justify this?

It is unnecessary to call attention to the large percentage of dentists who have made failures of their calling and who have retarded the uplifting of dentistry. It will probably be found that the majority of these failures come from the attempt to start in their work without any serious thought of what was really wanted, or what was especially suitable. To them the practice of dentistry looked easy and simple,—a little mechanical skill, a few tools, and an office being the most that was required to bring in good returns.

In contradistinction to this comes the college man prepared and equipped for any calling, who often does not select his vocation until he is twenty-one or twenty-two years of age. He has been trained to study, and has learned the necessity of understanding himself and his place before selecting a life-work. The result is a more certain and permanent decision. It is unnecessary to ask which of these two men will be the more reliable and achieve the greater success. And yet dental schools are virtually encouraging this early decision. Does the profession, or do the earnest, devoted members of it believe this the better plan?

It must not be inferred that the writer would discourage the selection of future vocation during the earlier years, for in many cases where conditions and adaptability are favorable an early selection would be advantageous and advisable. School and college courses could then be arranged with future work in view; but as a rule neither the boy nor

the parents are qualified to make an arbitrary selection before the real qualifications have manifested themselves.

It is not the province of this paper to question the purposes or powers of the National Association of Dental Faculties. That organization has undoubtedly considered all questions affecting dental schools and adopted such rules as their experience and judgment have dictated, but it is the privilege of men who have the advancement of the dental profession at heart to question that judgment in matters which affect the people as well as the profession.

If the conditions under consideration were non-essential, or were refuted, this paper would be uncalled for, but the condition is acknowledged by prominent members of that association to be not only of vital importance to dentistry, but of great seriousness to many who are considering it for their life-work. Members of that association, in their individual expressions, do not hesitate to give their views regarding this matter and to express the hope for a change, but in their official capacity as members of the National Association they decline to act or to take steps to correct the wrong. Therefore it seems eminently proper that this matter be called to the attention of the profession, through its societies and journals, and that the apathetic attitude of the National Association of Dental Faculties be considered by all who have the welfare of dentistry at heart.

It might be expected that a great representative body like the National Dental Association would take cognizance of this condition and make some attempt to have it changed, but it must be remembered that some of its most enthusiastic members are also members of the National Association of Dental Faculties and have a strong voice in the deliberations and policies of that body. And again, it might be expected that the Protective Association would turn its attention to this "combination," which to many dentists appears as exacting and arbitrary as patent and commercial combinations.

To the writer it is apparent that the time has come for societies to interest themselves in this matter and to carefully consider existing conditions. It should be their endeavor to assist dental schools and the National Association of Dental Faculties in solving this important question.

It has been my earnest hope that some writer or speaker whose pen or voice would command attention, or some society of earnest dentists, would note this injustice to dentistry, to the people, and to college men, and would endeavor to inaugurate a better arrangement. So far as I can learn there is no change in contemplation.

COLLEGE GRADUATES AND THE EXAMINING BOARDS.

In the meantime, while dental schools, the National Association, dental societies, and individual dentists are considering this matter and doing nothing, the college man stands before us, questions our purpose, and awaits reply. To many college men it seems too much like going backward to give their college work a second place, and many of them can ill afford to give four years' more time and expense for a diploma from a dental school. They then ask if a diploma is indispensable to the practice of dentistry in this state, and if it is not imperative, what is the outlook for them?

At the present time there are no standard requirements for practice good for all parts of the country. Each state and territory establishes its own requirements. In some states there are reciprocal arrangements, but as a rule each state acts independently of the others, and the consequence is a variety of requirements. It is to be hoped this condition may soon be improved. In the Cosmos for March 1899 is an editorial upon this subject by Dr. Kirk, who, at the close of his article epitomizes the various state laws and their histories.

A large majority of the states license practitioners—(1) upon presentation of a diploma from a reputable or acceptable dental college, and (2) by a satis-

factory examination of the candidate by the state board of dental examiners. Wisconsin is one of these latter states. At a recent meeting this society had under consideration some proposed changes in the laws regulating the practice of dentistry in this state. One of the changes proposed would permit a graduate of a dental school whose entrance requirements were equal to the entrance requirements of the University of Wisconsin for admission to its law department, to practice in this state without examination. This is along the line toward higher ideals, but does not give the graduate of the university any higher standing than a graduate of an accredited high school.

In this connection it may be timely to state that at the time of Dr. Kirk's compilation in 1899, only six or eight of the forty-three states having dental laws required a diploma from a dental school before permitting a man to practice, and that in some of the older and more experienced states a diploma from a dental school was not recognized by their boards, and an examination before the state board was imperative upon all, whether the applicant had a dental school diploma or not.

It is therefore eminently practicable for an educated man, especially one who has attended the scientific course and had laboratory training, who has given careful attention to the requirements of the state board, who has fitted himself by careful study and private instruction, and who has attended a dental school long enough to acquaint himself with the technique, clinical demonstrations, and practical matters, to qualify himself to come before the state board for examination.

By this course a man's college work need not be given a back place or his pride be humbled. In fact, this is the opportunity for a college man with pluck, but who cannot afford a further four years of time and expense. The time required to become fitted to appear before an examining board will vary with the skill and ability of the applicant.

A college man has the advantage of

the long-continued habit of study and application, and he ought with these advantages to accomplish in two or three years what would take others four years.

This is simply suggestive, but I believe it is sound advice, and rather than lose the college man in dentistry I would unhesitatingly advise him to follow that course. This advice must not be accepted to the disparagement of dental school training, for I believe in it thoroughly, and gave practical evidence of it nearly forty years ago when I was one of the only two dental school graduates in this state.

But, with all my enthusiasm and love for dentistry, it is my advice to any young man seeking to enter it, to first prepare himself for life so that he may be ready not only for dentistry, but for any calling which at any time may be found more acceptable to him. In my opinion a diploma from a dental school should be secondary to the degree of a university or scientific school.

A diploma certifying to the completion of a full course in dentistry ought to be secured at some time by every dentist, but that does not necessarily imply that it must immediately follow a diploma from a university or scientific school. If dentistry is the matured choice and one cannot immediately afford a full dental school course, then let the dental diploma come later when conditions are more favorable, after business has been established or when the time is more propitious. The state of Wisconsin has provided for this contingency by establishing a board of examiners to pass upon the qualifications of just such persons.

The state has undertaken to regulate the practice not only of dentistry, but of law, pharmacy, and medicine along lines that indicate a regard for the welfare of its citizens. I have faith that this guardianship will continue. The state of Wisconsin is maintaining at enormous expense one of the great institutions of learning in America, and in my opinion it will continue to encourage the highest education of its people, but it must be a little amazed to find that a diploma from

its university, when presented at a dental school, ranks no higher than a certificate from a high-school second year.

ATTITUDE OF THE DENTAL SCHOOLS.

The independent attitude of dental schools, which practically ignores a higher education, and which virtually places a dental school in advance of a university, is therefore a matter which concerns the people as well as the profession. Universities are maintained, not for themselves or pecuniary gain, but for others,—for the welfare of the people. Are dental schools organized and maintained with that purpose mainly in view?

The present independent attitude of dental schools is untenable and misleading, and is made the more objectionable and aggravating by the fact that universities and scientific schools have not only the very best qualified instructors and equipment for their work, but that many leading colleges have recognized the importance of special training for medicine and dentistry by arranging special courses leading to these professions. They have also demonstrated that it is

possible and practicable to arrange the completion of a four years course in three years, and encouragement is given to especially well prepared and industrious students to thus shorten their college course.

In conclusion I summarize the points this paper proposes to emphasize:

(1) The development of dental education necessitates a raising of requirements to entrance to dental schools.

(2) It is impracticable to set the present requirements to the standard of college training.

(3) Until the standards can be raised, encouragement should be given college-educated men to enter the profession.

(4) Leading educators consider eighteen to be the most desirable age for entering a classical or scientific school; certainly, then, that age at least should be attained before entering a professional school.

(5) If dental schools do not encourage the admission of college-bred men by giving them advantages over those meagerly prepared, the natural entrance to the dental profession for the college man is through state board examinations.

A COMPARISON OF HAND AND ENGINE INSTRUMENTATION.

By **W. H. K. MOYER, D.D.S., Little Falls, Minn.**

(Read before the Iowa State Dental Society at its annual meeting, Des Moines, May 6, 1902.)

IN presenting this subject I wish first to bring forward the idea that in every case of operative procedure where the work to be done may be classed as permanent, we must take into consideration two standpoints, the one of the operator, the other of the patient, and the elements or factors which enter into them.

From the standpoint of the operator, the first element to be considered is durability—that is, that the operation shall be lasting or permanent; second, the esthetic, which is concerned with the ap-

pearance alone; and third, the time to be consumed in the operation. These factors are given in the usual order of their importance to the dentist, and with a few exceptions the same elements are to be considered from the patients' standpoint, but with the addition of a very powerful element which we often find first in importance in their minds—that is, the pain to be endured by them.

The constant struggle of the humane dentist is to make these elementary ideas of operator and patient harmonize, or, in plainer language, to attain his ideal of an

operation in a manner that causes the least possible pain to the patient. This paper is written in the hope that in some measure it may serve to point out the advantages to be derived along this line from the proper choice and use of instruments. The dread of the dental engine is a powerful factor in keeping many people from having dental operations performed of which they are much in need.

A frequent query addressed to the dentist as the patient is about to take the chair is, "Doctor, are you going to use that thing?" pointing to the dental engine. Without lowering our standard of operating, can we not teach our patients to have less dread of the dental chair? Is it not possible for us to do a very large portion of the work that is usually accomplished with engine instruments by the use of hand instruments, doing the work as well or better and consuming no more time for the operations. If feasible, does not our duty to our patients demand that we follow the latter method?

NECESSARY HAND INSTRUMENTS.

What are the instruments needed for hand work? A good assortment of chisels of various angles and different bevels that will enable us to cut with the line of enamel cleavage on any surface or angle of any tooth. An assortment of excavators that will enable us to cut in any given direction in any part of a cavity which we may desire to reach. By following the lines laid down for simplified cavities we find that the number required is not large, as a cavity that is properly extended for prevention of future decay, for anchorage, or convenience is usually accessible to simple forms of excavators. These instruments must be of good temper, hard enough to hold an edge, but not hard enough to chip. For home-made instruments a temper given to a chisel or an excavator by heating to redness and plunging into a bar of soap is about right.

They must be carefully sharpened on the bevel best adapted for cutting and always kept sharp. No cutting that is at all satisfactory to either patient or

operator can be done with a dull or half-sharpened instrument. An oiled Arkansas stone of fine grit and level surface laid on a good foundation is all the equipment required for this work, though the skill to use it successfully comes only with practice. The instrument to be sharpened should be held lightly in the fingers like a lead pencil, brought to the proper bevel, then swept back and forth over the stone with a full forearm or whole-arm motion, great care being exercised to maintain the proper bevel.

An excellent rule to adopt is to never return an instrument to the case until it has been resharpened, and if followed a very few strokes on the stone brings the edge to almost a razor keenness, which makes its use a pleasure. This work can be done with an Arkansas stone on the lathe-head, but is not liable to be done as well, or rather is overdone by using up more of the instrument than is necessary at each resharpening.

We all recognize or are familiar with two kinds of decay, which may be termed decay of enamel and decay of dentin. A typical case of decay of enamel is a cavity on the buccal surface of a lower molar where the diseased area may include two-thirds of the buccal surface and barely enter the dentin, though the enamel is involved from one angle to the other. A typical case of decay of dentin is in the first permanent molar of a child, where, through a defective fissure, the micro-organisms have gained entrance and through this condition have had the opportunity for unobstructed work on the dentin out of reach of food excursions or other cleansing processes. In this latter class of cases hand instruments are especially indicated. Let us take a sample case: A child is presented to us for examination. The molars are large and strong in appearance with well-marked cusps and deep fissures. A lower molar shows a black line in the central fissure, a fine exploring-point may be made to enter a little way or even go between the plates of enamel. The rubber dam is adjusted and the tooth dried, then with hatchet chisels of right and left cut, beginning at the fissure, the enamel is

chipped off from each side until we reach an area where it is supported by sound dentin.

Very often we find that most of the occlusal surface between the points of the cusps may be chipped away with little effort on our part and no pain for the patient. The desired marginal form of the cavity should now be secured and the walls squared up before an excavator is entered to remove the decay. Then with a spoon or hatchet excavator with thin blade and keen edge, entered at one side, the bulk of the decayed material may be lifted out with a few sweeps. The floor or pulpal wall may then be squared up by using hatchet excavators, or if decay extends to a dangerous degree pulpally a little cement will do it effectively. Slight grooves in the dentin for convenience, made with small obtuse or right angle excavators, complete the cavity.

Those of us who have watched many operations know that frequently with a cavity like the one described the first procedure is to move up the dental engine, insert a small bur, open into the cavity, then follow with different sizes of burs, cutting out enamel, dentin, and decay indiscriminately until the desired cavity is obtained, regardless of the pain caused or in some cases the groans and tears of the patient.

Frequently children are so frightened or hurt by machine operations that a dread of the dental chair is carried through life. We all have children brought to us who have literally to be dragged to the office and burst into tears at the sight of the dentist. Upon looking up the history of these cases, we frequently find a record of some cruel work that has needlessly frightened the youngster.

If, as is often the case, the filling to be made is the first dental operation the patient has had performed, the impression made is the predominant one for life, too often deciding the patient as to future dental work; so it behooves us to make it as little disagreeable as is consistent with good work. The illustrative case taken was of a child, but in favorable cavities the principles of hand work are

just as applicable to each one of our patients.

In most cases of dentinal decay hand instruments are more effective and as a rule cause less pain than engine instruments. In most extensions where the enamel is undermined, hand instruments are to be preferred. For approximal cavities, in the large majority of cases proper lateral extension can be easily obtained without resort to the engine, often the only use for it in such cases being in obtaining occlusal anchorage.

Engine instruments have their proper field for use, but this must not be confused with the proper field for hand work. By the introduction of engines driven at high speed by electric power evil habits have grown among us apace until it is high time to call a halt. To show the degree to which some operators depend on their engines, I wish to cite the case of a friend of mine, who is present, whose office I visited during my student days. This was before he had invested in an electric outfit, but he had an assistant whose duty it was to tread the engine for him. Some talk about hand work came up, and the fact was developed that he had in his office just one chisel, which did duty both at the operating chair and for vulcanite work in the laboratory. Since then that friend has seen a great light, so that now he has in his office an assortment of hand instruments and the ability to use them as they should be used.

IMPROPER USE OF ENGINE BURS.

In one college I attended the electric engine was so omnipresent that a conservative estimate would be that nine-tenths of the cavity preparation was done with burs. My meager assortment of chisels and spoon excavators was never questioned, even though the cutting edges were usually blunt and only re-sharpened when much power exerted failed to bring about results. It is generally recognized that the most sensitive part of a tooth is at the dento-enamel junction. Cutting in enamel is usually painless, as is also cutting in a body of dentin. When using a bur this sensitive

dento-enamel junction is under the blades, so that oftentimes the pain is exquisite. If by using chisels we can first chip away the enamel, we often find it possible to do the necessary cutting in the dentin with little pain. This is often noticeable when cutting a step for an occlusal anchorage. By first cutting a slot with a small inverted cone bur along the line of the central fissure, then enlarging by chipping away the enamel with chisels, much less pain is caused than if we use a large bur that would give the desired width of step at first.

What are the proper places for using burs? It may be answered: (1) In buccal, labial, and occlusal cavities when the enamel is too strong and well formed to be broken down with chisels. (2) In cutting through large portions of solid enamel or dentin, as in the case of an occlusal step in a bicuspid or molar, or in opening into pulp-chambers. (3) In squaring-up walls, and sometimes margins, where considerable cutting is to be done. (4) In making some convenience points a bur is needed. (5) In distal cavities in third molars, or molars and bicuspids, when the tooth to the distal has been removed and the conditions do not indicate lateral and occlusal extension. This list may not include all the uses for a bur, but I trust the principal ones are there.

Now as to the burs used. In having an operation made in my own mouth I am not nearly so much concerned with the aseptic conditions as with the sharpness and cutting qualities of the instruments to be used. Buy burs of good material and temper, whose blades are of even length so that they cut in the same plane. For any extensive cutting in enamel take a new bur for each case. A bur that has been once used on enamel to any extent has its edges smoothed or rounded, if not chipped so as to be unfitted for another case. This condition cannot always be detected by testing on the skin or finger-nail, for some blades may retain an edge while others are useless. A jeweler's small magnifying glass will quickly discover their true condition so that no mistakes need be made. It is

needlessly cruel to try their cutting qualities on a patient's tooth to decide this.

Cutting is least painful when done with sharp instruments, as is also the secondary pain from heating caused by friction. A bur used until the cutting edges are "as smooth as a burnisher" when run at high speed causes exquisite pain though it does little work. It literally "melts down the tooth-substance."

HAND INSTRUMENTS ON FINISHING.

In the department of finishing fillings there is also vast room for improvement along the line of instrumentation. With fine saws in a good stiff saw-frame some expeditious work can be accomplished on approximal fillings, while an assortment of finishing files of different cuts and angles serves to trim fillings to a contour that cannot be obtained with disks and stones in a dental engine. In too many offices disks take the place of saw, files and strips, even in trimming that very vital part of a filling, the contact-point. A contact-point cannot be properly made by using disks, it matters not how careful and skillful an operator may be. Approximal fillings can be beautifully polished with disks, but not trimmed or properly finished.

As in the preparation of cavities, the engine instruments have their proper field for use, but again this must not be confounded with the place for hand instruments. Bucco-occlusal and flat surfaces, and in the embrasures, are the proper places for stones and disks, but at no time is it good practice to run a disk between teeth at their contact-points for the purpose of trimming a filling.

More than any one thing that militates against the steady upward progress of our profession along lines of skill is the dominating spirit of the age, affecting all professions and lines of business to a greater or lesser degree. Commercialism is the foe with which we are constantly in conflict. The greatest ally which this foe has in our own camp is the electric engine, which, like a great many good things, is only dangerous as it is abused.

How many operations are ruined by too much cutting either in the cavity preparation or trimming of the filling. How many pulp-chambers are opened through to the process! How many Gates-Glidden drills are broken in canals! Please do not take this as a tirade against the electric engine, for it is only the abuses of which I speak. The machine itself is excellent, but is not intended to perform an entire operation with the exception of applying the rubber dam.

For the good of our patients and ourselves let us study this matter so as to enable us to use the proper instrument in its proper place, striving to make each piece of work in the same way, and as nearly as possible like one we would wish

made in our own mouth. Only in this way can we be true to the highest that is in us and accomplish the greatest good for both humanity and ourselves.

In his famous Christmas sermon Robert Louis Stevenson makes use of this epitaph: "Here lies one who meant well, tried a little, failed much." In our work as busy practitioners, can we not take the high resolve to have this slightly changed when the time comes for us to join that "innumerable caravan"? Let all of us strive to so perform our daily tasks that when we have passed into the "great unknown" our fellow practitioners can truthfully voice for us a transposition of this epitaph: "Here lies one who meant well, tried much, failed little."

SOME SUGGESTIONS IN THE USE OF A LOCAL ANESTHETIC.

By CHARLES S. TULLER, D.D.S., Shreveport, La.

IN the eucain B hydrochlorate we have, to my mind, not only the safest but the best local anesthetic on the market to-day. After using it in over three hundred and forty-three cases of extraction and in numerous cases for the preparation of roots for crown and bridge work, I have yet to find the first case of sloughing or any bad condition whatever in the mouth resulting from its use. Nor have I ever had a case of the slightest depression of the heart or of respiration resulting from the use of the drug. Most of the made-up solutions on the market are cocain solutions needing some agents in their composition to preserve them and to prevent septic conditions. Most of them are more or less harmful, not to say dangerous.

Unlike cocain hydrochlorate, eucain B hydrochlorate is a carbon compound and not of vegetable origin. It is preferable to cocain in that its aqueous solutions are permanent and can be sterilized by heat *without decomposition*. This is due to its immediate derivation from

pure chemicals instead of from vegetable sources.

Anesthesia is produced immediately and does not cause hyperemia of the mucous membrane. Vinci claims that its solutions possess moderately antibacterial powers, and that it is relatively safer than cocain so far as circulation and respiration are concerned, being about eight times less poisonous. Poisoning and death are due to *large* doses. For dental purposes a two per cent. solution will answer in every case. This may be prepared in any quantity by mixing the proper proportions of eucain B with distilled water, then bringing the mixture to the boiling-point, which will make a perfectly clear solution. This solution, besides being perfectly stable, is slightly germicidal, and to be sure of perfect asepsis a little may be poured into a test tube and brought to a boil over an alcohol flame before using in each operation.

In regard to the care of the hypodermic syringe, if one with the leather packings be used, it will be found that if a

little glycerin is drawn into the barrel after each operation and left there it will keep the leather soft and make the plunger work smoothly. Before using, the glycerin should be forced out and the barrel drawn full of alcohol a couple of times to sterilize it. The barrel is then drawn full of the eucain B solution, the syringe inverted, and all the air forced out.

Before placing the needle the surface of the gum is to be wiped dry, and at the point of insertion a very small quantity of carbolic acid applied on a small pellet of cotton, which will anesthetize the initial point of puncture. The entire surface of the gum around the tooth should be wiped with alcohol as an anti-

septic precaution. The point of the needle is inserted into the tissues until it is well under; then the anesthetic is forced into the tissues until they are bleached white over an area of say one-half a square inch. The needle is removed and inserted again just inside the edge of the ring of bleached tissue and more anesthetic forced in, continuing the process until the gum surrounding the entire tooth is bleached white.

Anesthesia is complete at once, and one may use the lancet and forceps with impunity. Instruments must be kept clean, and when the directions are followed success will crown the effort and no bad effect and very little pain will result.

CORRESPONDENCE.

TISSUE PAPER AS A SEPARATING MEDIUM IN VULCANITE WORK.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In vulcanite work cases frequently arise in which there is some difficulty in flasking the piece so that on separating the flask the plaster will not be broken.

For example, in flasking those cases in which plain teeth or blocks are fitted to rest directly on the gum, the plaster must extend to the incisive edge of those teeth so that they will remain accurately in position and not come away with the upper half of the flask.

Now, if in this case we have a high vault, even if we use a deep flask the plaster covering these teeth will extend well above the edge of the lower half of the flask.

Trim the plaster on top level with the incisive edges of the teeth. Trim it in front and at the sides nearly vertical—beveled just enough to allow the upper ring of the flask to be placed in position. Now, instead of varnishing or soaping the plaster, use tissue paper. Take strips

about half an inch wide, moisten them, and cover all the plaster, but not the wax or tin. If there be a fissure between the ring of the flask and the plaster, insert a rope made from a strip of wet tissue paper to prevent the plaster from flowing into it. Pour the upper half as usual, and when hard, separating cannot be attended with any accident. The tissue paper is removed before packing the case.

Of course, tissue paper as a means of separating is applicable to every case, but is especially advantageous in difficult cases and repairs in which the level of the separating surface is much higher or lower in parts than the line of division between the halves of the flask.

The tissue paper can be placed and the upper half poured without waiting for the plaster in the lower half to set.

Yours truly,

JOS. H. NOBLE, D.D.S.

PHILADELPHIA, PA., March 2, 1903.

PROCEEDINGS OF SOCIETIES.

INTERNATIONAL DENTAL FEDERATION AND INTERNATIONAL COMMISSION OF EDUCATION: MEETING HELD IN STOCKHOLM, SWEDEN, AUGUST 1902.

International Commission of Education.

(Continued from page 130.)

MONDAY, AUGUST 18TH.

Dr. QUEUDOT, Paris, presented a report on "Dental Education" on behalf of the École Odontotechnique of Paris. In substance he said that dental surgery is a branch of medicine, and that during the preliminary education of the future dental candidate nothing should be neglected that could in any way develop the literary, scientific, and artistic sense of the student. Like the physician, the dentist should possess a good basal knowledge of literature and science, as these are important factors in carrying out the duties of his calling.

Dental education, he claimed, comprises two distinct parts—namely, the scientific group and the technical group of studies. The technical group is the application of the knowledge acquired from the scientific group. The first duty of the dental student should be to acquire a sufficient degree of knowledge of anatomy, histology, pathology, bacteriology, and of all other branches which strictly speaking cannot be called medicine, but which are, however, the basis of medicine and of all its specialties. After acquiring the necessary preparatory education referred to, and only then, should the student be permitted to enter upon the study of the dental branches, in our clinics as well as in the several dental schools.

Dr. VINCENZO GUERINI, the official delegate of the government of Italy, then presented the report which here follows:

REPORT TO THE INTERNATIONAL COMMISSION OF EDUCATION BY DR. VINCENZO GUERINI, ITALY.

Gentlemen,—I wish to bring before your consideration several general ideas regarding the subject of dental education, but before doing so I must refer to a special feature of dental education in the country which I represent, as this is in strict accord with the ideas which I will now discuss. For about twelve years there has been a law in Italy which requires that all dentists must be holders of the degree of doctor of medicine before they can be allowed to practice their profession. This legislative measure presents great inconveniences, as I have on several occasions endeavored to demonstrate. I have pointed out the necessity that odontology should be taught as a separate and autonomous science, and not as a simple branch of general medicine. I found myself in the necessity of discussing this topic with the *medecins-dentistes*, and as soon as this was taken up I found that in order to defeat my adversaries the first thing I had to do was to recognize whatever truth could be found in their arguments, this being in my estimation the only way of clearly demonstrating the fallacy of their conclusions.

In the arguments advanced by the *medecins-dentistes* we find some truthful assertions, viz: That in order to practice dentistry upon a scientific basis it is necessary that the practitioner should possess a rather extensive medical education. As dentists are called upon to treat living organs, it is indispensable that they should thoroughly understand all the disturbances that may affect these organs, all the organic or extra-organic causes which may bring them about, and all the possible relations of dental and peridental diseases to the rest of the organism. If this be admitted, it follows as a rational consequence that the

medical education of dentists must not be too limited nor too superficial, as in order to be in a position to understand thoroughly everything concerning dental diseases and their relations to morbid conditions of the organism it is necessary to possess a large share of medical science. I am therefore convinced that dental schools will have to extend gradually the scope of medical teaching, as the extent of the medical branches taught in dental schools at present is certainly insufficient. As an example, I will quote from the report of Dr. Charles Godon, of Paris, in his work, "Evolution de l'Art Dentaire."

From this report we gather that in the École Dentaire of Paris about four-fifths of the total time is devoted to technical teaching and only one-fifth to the scientific and medical subjects, to the importance of which we are now referring. If we consider that the dental course covers three years—that is, about thirty-six months—it is easy to see that by this arrangement the entire medical education required from the dental student could be given him in seven months, including in this time vacations and holidays. Now, you know that medical students who devote from five to six years to the study of this science leave the school after this time with a very incomplete knowledge of medicine. The time devoted to the teaching of medical branches in dental schools is very limited, and therefore the student can acquire only a very limited and superficial knowledge, which will not help him to understand the pathology of the dental and peridental organs and the complex relations which exist between these parts and the rest of the organism from the points of view of the etiology, pathology, and therapeutics of the disorders of which these organs may be the seat.

It is true that it has been decided to increase the course to four years, but, as far as I am aware, this fourth year will be devoted entirely to technical teaching; therefore even with a four years course the medical education of dentists will remain just as imperfect and insufficient as it is at present. I believe in the necessity of extending the course to a five years one, and during this period the dental student should be taught both general medicine and dentistry. I believe, further, that the curriculum should be arranged in such a way that the student might be able to devote at least four hours a day to medical subjects and the remaining five or six to strictly technical subjects. Five or six hours a day during five years should be sufficient to make skillful dentists, and on the other hand four hours a day devoted to

medical subjects during five years should create dentists possessing a reasonable amount of medical education. They would have an amount of medical knowledge at least sufficient for the practice of their profession upon a scientific basis.

Regarding the question as to whether medical subjects should be taught in the dental schools or in the medical schools, I will positively answer that the medical subjects to be taught to dentists should be given by teachers making a specialty of these subjects in their bearing on dentistry. The necessity that the medical education of dentists should be a special one is certainly evident. Let us take as an example, anatomy. On the bucco-facial region the anatomical training of the dentist should be more complete than that of the physician, just as, on the other hand, the anatomy of other regions could be suppressed from the curriculum or given in a more superficial way without at all injuring the dentist's education. For similar reasons, the teaching of other branches of the medical program in dental schools should differ from the teaching of the same branches in the medical school.

To summarize, we will say that for dental students the course should be altogether a special one, and its purpose should be to impart to the student without the slightest loss of time the greatest amount of medical knowledge that will be useful to him in the practice of his profession.

I also wish to call your attention to the question of *preliminary education*. Unfortunately, this question cannot be treated in a general way, because of the great differences presented by the organization of primary or elementary education, especially of the secondary education, in different countries; notwithstanding this difference in organization, however, I believe that the total duration of the studies that dental students should take up before entering institutions of higher education should not vary a great deal in the different countries. This involves, say, about twelve years. I believe that the preliminary education of dental students should be the same as that required from the physician, the lawyer, the engineer, etc. With a preliminary education of this sort lasting twelve years it is possible to undertake the study of dentistry after having acquired a good literary and scientific education, comprising among other things the study of ancient and modern history, physics, chemistry, natural history, mathematics, languages, etc. All these studies are apt to develop the intelligence of the student and will serve the purpose of excellent preparation for the study of dentistry, per-

mitting the dental student to assimilate easily the knowledge which will be imparted to him in the professional schools. The better educated the dentist is, the more will he be respected. It is essential that he should cease to be inferior to the physician from lack of either general culture or scientific requirements. He should rise to the same level as the physician, and should be prepared to intelligently discuss with him any scientific subject. He should be able to write correctly and easily, in order to be in a position to increase the literature of the profession by contributing works on dental topics. It would be a shame for the profession, if the greatest part of its literature were written by physicians, and not by dentists, as has already been asserted.

For the foregoing reasons, I am led to express the wish that dental candidates should have a more complete preliminary education, and that in the curricula of dental schools more time should be devoted to the study of medical subjects.

Dr. FÖRBERG then read the following report:

DENTAL LEGISLATION IN SWEDEN.

The laws regulating dental practice in Sweden are very old, and as they have been considerably changed since the establishment of a dental institute, I deem it best to give only such points as will serve to make the subject clear. Since the foundation of this institute all dental instruction is given there, and the studies are obligatory.

Every one wishing to matriculate at this dental institute must present himself before the dean and produce his certificate of birth, testimonials as to his moral character, etc., from his clergyman, and a certificate from a high school that he has passed his final examination, which qualifies him to enter a university (maturity examination). This certificate must show that he obtained good marks in mathematics and physics, otherwise he must pass special examinations on these subjects.

There is only one dental institution in Sweden. It is the Dental Department of the Caroline Medico-Chirurgical Institute of Stockholm. It is a state institution. The course comprises three years, of about eight months, each year divided into two terms. During the first year the student attends the lectures in the medical department on medico-scientific subjects, in courses specially designed for dental students. At the end of the year the student is examined in these subjects. This is called the "dental candidate

examination," and if passed it entitles him to matriculation in the Dental Institute. Here he receives practical dental instruction for two years.

The final examination before becoming a legal dentist is given by the professors of the dental department and the professor in general surgery of the medical faculty as examiners, before an examining board consisting of the inspector (dean) and two practicing dentists (chosen yearly) as censors. When the candidate has passed his examinations at the dental department he receives a certificate, and is referred to the Royal Medical Board, from which he receives his diploma as authorized dentist (*Tandläkare*). The Royal Medical Board (*Kongliga Medicinal Styrelsen*) is therefore the licensing board.

Women have the same rights and privileges as men in regard to the study and practice of dentistry. Physicians have the right to practice dentistry without being obliged to pass any examination.

Dentists are allowed to prescribe drugs, and even poisons, for external use, but the administration of a general anesthetic must take place in the presence of a physician.

There are about three hundred dentists in Sweden, of whom more than one-third are located in Stockholm. There are three Swedish dental journals—*Nordisk Tandläkare Tidsskrift* and *Odontologisk Tidskrift*, of Stockholm; and *Reflector*, of Gothenburg. The Swedish dental societies are—Svenska Tandläkare-Sällskapet, Göteborgs Tandläkare-Sällskapet, Skaraborgs Tandläkare-Sällskapet, Malmö Tandläkare-Sällskapet, and Odontologiska Sällskapet. The members of the last four societies are at the same time members of the Svenska Tandläkare-Sällskapet and of the Scandinavian Dental Association, which is common for the three countries.

Dr. JOS. ARKÖVY presented a report embodying his views on the subject of dental education with especial reference to the three questions proposed for discussion by the International Commission of Education. This report is here omitted, as his views are fully expressed in his report published in the Proceedings of the International Dental Federation and International Commission of Education for 1901.

The following is the report submitted to the International Commission of Education by the Canadian representative, Dr. Chas. E. Pearson:

REPORT ON THE THREE QUESTIONS PROPOSED
BY THE INTERNATIONAL COMMISSION OF
EDUCATION OF THE INTERNATIONAL DENTAL
FEDERATION. BY CHAS. E. PEARSON, L.D.S.,
D.D.S., TORONTO, CANADA.

Regarding the three questions proposed by the International Commission of Education, your representative considers it advisable to quote from a very able article which appeared in the *Journal of the British Dental Association* for April and May, 1901. The writer of the article, A. E. Webster, D.D.S., M.D., professor of orthodontia and demonstrator in operative dentistry in the Royal College of Dental Surgeons, is editor of the *Dominion Dental Journal* and is a recognized authority on educational matters. The article referred to is detailed and complete, giving the full requirements, subject by subject, for matriculation to the school of the R. C. D. S., with examination papers, and a detailed statement of the course of studies in dentistry, also giving examination papers.

The quotations from this paper of Professor Webster's furnish answers to the three questions asked by the International Commission of Education.

QUESTION 1—"What are the preliminary studies to be required of students before beginning their professional education?"

"The by-laws of the board of directors provide that every person who wishes to practice dentistry in Ontario shall matriculate in the Royal College of Dental Surgeons of Ontario. The board does not hold a matriculation examination, but accepts an official certificate of matriculation in arts in any Canadian or other recognized university, or of having passed the Ontario Educational Departmental junior or senior high school leaving examinations. These examinations are conducted by the Education Department, and are held simultaneously at every high school in the province once each year. All candidates write on the same examination papers. The answers are read and graded in the city of Toronto by teachers who gather there for that purpose. The junior leaving examination, which is the lowest standard of matriculation that the Royal College of Dental Surgeons will accept, embraces the following subjects and standards:

"*Part I, junior leaving standing.*—The subjects prescribed are—Reading, drawing, geography, botany (or agriculture), writing, with book-keeping and commercial transactions, English grammar, English literature, arithmetic and mensuration, English composition and history. *Part II.*—The subjects prescribed are—English grammar and rhetoric,

English composition, English literature, ancient history, arithmetic and mensuration, algebra, geometry, physics, and Latin, and one of the following groups: (a) French and Greek; (b) German and Greek; (c) French, German, and chemistry; (d) French, physics, and chemistry; (e) German and chemistry; (f) Botany, physics and chemistry.

"The arts matriculation of the University of Toronto is based upon and is similar to that of the University of London, Eng."

QUESTION 2—"In what are dental studies to consist, how long ought they to last, and what should be the order of the program?"

The course has been three terms of seven months' duration, but after 1902 it will be a four years' course of the same duration. The three years' course embraces the following:

First year, or freshman year: Anatomy (general). Fifty lectures: Minute anatomy of the bones and muscles of the head and neck.

Chemistry. Sixty lectures, including chemical physics, chemical nomenclature, symbols, combining weights and quantivalence and physical properties of the principal elements, and the preparation and chemical properties of oxygen, hydrogen, nitrogen, chlorine, sulfur and potassium.

Histology. Thirty lectures, including general histology and minute histology of the human teeth.

Bacteriology. Twenty lectures and demonstrations.

Comparative dental anatomy. Ten lectures.

Operative technique. Fifteen lectures, embracing topographical anatomy of the human teeth; dental caries; discussion of filling materials; cavity classification, root-canal medication and filling. Students must attend the technique laboratory eight hours each week during the session. In this course the student is expected to study the structure of the teeth and the anatomy of the surrounding parts. He must carve at least sixteen teeth from celluloid, making minute drawings of both longitudinal and cross sections of the teeth; practice root-fillings and medication; study and practice the use of instruments; form cavities in the carved celluloid teeth and fill them.

Prosthetic technique. Fifteen lectures, embracing the extraction of teeth, impressions, base-plates for artificial dentures, air-chambers, clasps, casts and dies, articulation of full dentures, manufacture of artificial teeth-crowns. Students must attend the prosthetic laboratory two hours each day of the session, and construct the following pieces: Partial upper denture in vulcanite; partial lower with vulcanite clasps; partial upper, with me-

tal clasps; repair vulcanite case; full upper and lower plain teeth, upper vulcanite, pink gum, air-chamber, lower cast metal; full upper and lower gum teeth, upper swaged aluminum, black vulcanite attachment, lower cast-metal base with pink gum; partial lower vulcanite with swaged metal stringer; partial upper swaged metal base; four gum teeth with rim and clasps, swaged upper metal base, wire edge, wire loops, air-chamber; Richmond crown; all-metal bicuspid crown; all-metal molar crown; metal bicuspid crown with porcelain face; Logan crown ground and set on a suitable root. Each case must be made to fit suitable models provided in the technique laboratory, and have a ticket attached to it when handed in for examination, to show that the demonstrator in charge has directed and seen the work in progress.

Metallurgy. Fifteen lectures, including the properties of metals, alloys, amalgams, lead, antimony, tin, bismuth, zinc, cadmium, copper, iron, aluminum, mercury, silver, iridium, palladium, platinum, gold.

Second year, or junior year: Operative dentistry. Fifty lectures on development of the teeth, clinical history and pathology of caries, pulpitis, pericementitis, and alveolar abscess; the composition and preparation of materials for filling teeth. The insertion of at least forty fillings in the teeth of patients in the infirmary.

Prosthetic dentistry. Fifty lectures. Extraction of teeth; composition and preparation of materials for taking impressions and for bases for artificial dentures; preparation of casts and dies for metal work; composition and manufacture of artificial teeth; the mechanical and esthetic construction of dentures on plastic bases; the construction and insertion of at least five artificial dentures for patients in the infirmary.

Crown and bridge work. Sixteen lectures. The construction of two crowns and three bridges of three teeth each, on models prescribed by the professor in the department.

Orthodontia. Twelve lectures. A study of the materials used and their application; the construction and adaptation of one or more appliances to a suitable model.

Porcelain work. Five lectures.

Anatomy. Fifty lectures. Minute anatomy of the head and neck and general anatomy. Dissecting the head and neck, and at least one other part, at the medical department of the Provincial University.

Chemistry. Fifty lectures. The whole subject. Attendance in the chemical laboratory four hours a week throughout the entire session.

Physiology. Fifty-five lectures. Circulation, respiration, and digestion.

Medicine and surgery. Fifty lectures. Inflammation, healing and reparative processes, treatment of wounds, luxation and dislocation of the inferior maxilla.

Materia medica. Fifteen lectures. Weights and measures, source of preparation and mode of administration of, and medical and dental use of, one hundred drugs. Prescription-writing.

Third year, or senior year: Operative dentistry. Fifty lectures, embracing the whole subject and including dental pathology. Each student must insert for patients in the infirmary at least forty fillings, twenty-five of which must be gold; successfully devitalize and remove the pulps of five teeth and fill the root-canals; insert porcelain fillings as directed by demonstrators.

Prosthetic dentistry. Fifty lectures, covering the whole subject. Each student must construct and insert for patients in the infirmary at least five whole or partial dentures, and also make a gum-section denture on a prescribed model.

Crown and bridge work. The student must construct and insert at least three crowns, or a bridge of not less than three teeth for patients in the infirmary.

Orthodontia. Ten lectures, covering the whole subject. Each student must treat at least one case in the infirmary.

Dental therapeutics. Fifteen lectures, covering the whole subject.

Physiology. Fifty lectures, covering the general subject.

Medicine, surgery, and general pathology. Fifty lectures. Students must treat such cases as come to the infirmary, and attend once a week the clinics of the Victoria Hospital.

Dental metallurgy. Twenty-five hours in the laboratory.

Bacteriology. Twenty-five hours in the laboratory.

No candidate will be admitted to final examinations who does not present certificates to show that he has inserted for patients at least one hundred fillings and at least eight whole or partial dentures. Fifty of the fillings and six of the dentures may be inserted in the preceptor's office.

Candidates must obtain at least sixty per cent. of the marks allotted on all examinations in order to pass. All practical work done through the whole course is examined and graded, and is counted a part of the examination as much as the written papers.

Candidates of good moral character, twenty-

one years of age, who have complied with the regulations and have satisfactorily passed all examinations, both written and practical, are awarded a certificate of license to practice dentistry in Ontario, and the title of L.D.S. (licentiate of dental surgery).

QUESTION 3—"What branches of the studies taught in medical schools must the student of dentistry follow?"

This question is answered best by studying what has been adopted by our school as stated in answer to Question 2.

PROPOSED CURRICULUM.

In conclusion, a proposed curriculum for the four years' course of the Royal College of Dental Surgeons of Ontario is appended. This curriculum for the course of four sessions is proposed to come in force October 1, 1903:

Add to present curriculum—Physics, physical diagnosis, and anesthesia; the practice of medicine, electro-therapeutics, institutes of dentistry to include history of dentistry, dental ethics, management of practice, advertising, etc.; laboratory, practical pathology; attendance at General Hospital.

Re-arrange the work—

First Year. Lectures—Histology, bacteriology, comparative dental anatomy, physics, materia medica, operative and prosthetic technics; commence anatomy. Laboratories—Histology, operative and prosthetic technics.

Second Year. Lectures—Therapeutics, orthodontia, crown and bridge work, complete anatomy, commence dental pathology, operative and prosthetic dentistry, commence chemistry. Laboratories—Practical anatomy, operative and prosthetic technics, crown and bridge work technic, orthodontia technic.

Third Year. Lectures—Metallurgy, electro-therapeutics, complete operative and prosthetic dentistry and dental pathology, complete chemistry, commence physiology, commence medicine and surgery, and general pathology. Laboratories—Infirmary, operative, prosthetic, orthodontia, crown and bridge work, chemistry, bacteriology, pathology, porcelain technic.

Fourth Year. Lectures—Complete physiology, complete medicine and surgery and general pathology, jurisprudence, physical diagnosis and anesthesia, practice of medicine, institutes of dentistry. Laboratories—Infirmary, operative, prosthetic, orthodontia, crown and bridge work, porcelain work, chemical metallurgy, clinical medicine and surgery at the General Hospital.

Dr. WEISER presented the following report:

REPORT ON THE THREE QUESTIONS PROPOSED BY THE INTERNATIONAL COMMISSION OF EDUCATION. BY RUDOLF WEISER, M.D., VIENNA, AUSTRIA.

The first of the three questions proposed by the International Dental Federation reads as follows:

"What are the preliminary studies to be required of students before beginning their professional education?"

There can be little doubt that all Austrian dentists are of the opinion that from one who intends to devote himself to dentistry the same preparatory education should be demanded as from one who will go to the university or to a polytechnic school, or who wishes to perform his military service as a one-year volunteer.

For my own part, I cannot but feel that the curriculum at most grammar schools and higher schools in most European countries loudly calls for thorough reform. In view of the increasing influence of sociology and the stagnation of parliamentarism, unceasing efforts are made to obtain for the members of the Sanitary Council such power in the departments of education as shall enable them to regulate the demands made upon the mental capacity of the young with due regard to the development of the rest of their organism, and to bring the ideals of mental education into harmony with the practical needs of political economy, instead of worshipping antiquated arrangements.

But the Austrian dentists are of the opinion that as long as admission to the university and the one-year volunteer service in the army is dependent on passing the matriculation examinations, the same should be required of those who intend to become dentists. For this opinion there are different reasons: First, this young and rising profession must desire that the social status of its representatives may not undeservedly sink below that of other branches of the art of healing. We dentists will not profane the spiritual inheritance of a Wedl, Salter, Heath, Garretson, Tomes, Leber, Rottenstein, Magitot, Malassez, Muehlreiter, Albrecht, Mills, Underwood, Mummery, Miller, Zuckerkandl, Taft, Kingsley, Bonwill, Martin, Case, Essig, Brophy, Arkövy, Rothmann, Partsch, Sachs, Scheff, von Metnitz, Bödecker, Walkhoff, Witzel, Ebner, Schaffer, Zsigmondy, Gis, Roese, Roemer, Preiswerk, and innumerable other researchers and promoters of our branch.

It certainly cannot be good for our science that less capable persons should receive official permission to enter it. Our calling cannot be

raised in the opinion of the public, and of our colleagues the medical men, if in a country with compulsory military service the dentists should rank lower than the veterinary surgeons, and if practical dentistry is the refuge of such as do not get on well at the grammar school or the higher school.

Of not less importance is the moral factor, which is tellingly pointed out by the German teachers of dentistry in a memorandum to the Bundesrath of the German Empire. They say:

"The requirements for matriculation gain increased importance from the consideration that all the knowledge and the accomplishments, the most thorough instruction, can be made useful only if the dentist, beginning practice with a really high conception of his calling and with a large measure of faithfulness to duty, undertakes his task of making the progress of modern dentistry useful to his patient,—undertakes it with the moral maturity which is generally to be expected of older persons.

"Under present circumstances young men mostly enter the final class of the grammar school in their sixteenth or seventeenth year. Then they begin their dental studies, and mostly conclude them after three years, when they are in their twentieth year. Even supposing they then become assistants for two or three years—which is the case with only a fraction of them—they become independent at a time when in general they do not yet possess the manly stability and the mature gravity which are demanded by intercourse with the public and by responsibility in difficult situations, *e.g.* administering narcotics, and in the carrying out with proper insistence the demands of dental science. No wonder, then, that many a one stumbles, and to his own detriment gives way to dangerous temptations; too often he has to lament that in his practice he should have turned from the creditable principles which he brought with him from the university, and should have taken to greedy bleeding of the public because in that way it seemed possible to make money more quickly and easily. The measure of care, perseverance, thoroughness, and faithfulness to duty possessed by a conscientious dentist is particularly large; the great pains and the expenditure of time necessary—and which at the moment, considering their object, seem extravagant—often tempt the less serious, immature characters to neglect their duty, and all too often, instead of painstaking, thorough work, which alone can be successful, there is a scamping done with dazzling facility and rapidity."

Questions 2 and 3 of the International Commission of Education are—

"(2) Of what are dental studies to consist, how long ought they to last, and what should be the order of the program?"

"(3) What branches of the studies taught in medical schools must the student of dentistry follow?"

For the Austrian the answering of these two questions becomes decidedly easier, and the report will seem clearer if the order of the questions be altered.

Since the Austrian dentists agree in the principle that dentistry forms a branch of the healing art in general, which demands a special education and training, the matter to be presented now resolves itself into the discussion of Question 3.

As was referred to in my report in collaboration with Dr. Zsigmondy to the International Dental Federation, London, 1901, I here again give expression to the conviction that the unexpected and enormous development of the entire healing art, as a branch of human knowledge which it is quite impossible for one person to master completely, loudly calls for a reorganization of the course of medical study. On the part of students and practitioners it is sought—by the requirements of the people it is compelled—to give the medical student first of all a three years' fundamental education, and then to divide the remainder—say two years—of his course into branch subjects.

A common medical foundation for all those who later will devote themselves to a special branch of medicine affords, first of all, the advantage of admitting into the ranks of the profession only educated doctors with a wide mental horizon, and those whose powers of observation have been guided into the right channels; and secondly, such a foundation enables the student to decide on this special branch only after a deeper insight into the situation, and enables him with insignificant loss of time to change, if at the beginning of his special studies he should find that he has not chosen in accordance with his own inclinations and abilities.

In my opinion this general training to be demanded of all physicians would have to comprise the following departments: Descriptive anatomy, connected with practice in dissecting, physiology, histology, bacteriology, pathological anatomy, general experimental pathology, internal medicine, pharmacology, surgery, skin diseases, and syphilis.

It would be exceeding the limits of this report were I to point out in detail how im-

portant is each of the subjects above mentioned to him who wishes to have a real right to the name of doctor. The only argument that I will bring forward for the importance of the demand is that he who inflicts wounds for curative reasons should be acquainted with the course of the arteries, with the lymphatic glands, with the stopping of bleeding, the nature of wounds, and their treatment. The proposal that one and the same patient be treated by two or more specialists would be practicable sometimes in large towns, but not in small ones, and the simultaneous treatment by several doctors will meet with pecuniary difficulties as well as those of locality and time.

Having regard to our responsibility to our patients and the judicial authorities, the demand that medical practitioners should be acquainted with the appearance of syphilis and with the measures for protecting against its transmission is certainly amply justified.

As to the question, "Of what are dental studies to consist, how long ought they to last, and what should be the order of the program?"

On the ground of my experience that even very talented and diligent Austrian physicians who, after finishing their medical studies, have devoted themselves to dentistry cannot without danger be employed in a good practice in a large town before the expiration of two or three years, I think it necessary that students' theoretical and practical instruction in the purely dental subjects (that is, after completing fundamental studies, lasting four or six terms) should comprise five or six terms.

First year. Morning—Descriptive anatomy with practice in dissection; physiology; bacteriology. Afternoon—Practice in chemical laboratory; histology and microscopy.

Second year. Morning—General and experimental pathology; pathological anatomy; treatment of internal disorders. Afternoon—Pharmacology; afternoon visit to the clinic for internal diseases; theoretic lectures on dental surgery.

Third year. Morning—General surgery; special surgery of the mouth and maxillary sinus; skin diseases and syphilis; practical exercises in the preservative treatment of the teeth; phantom. Afternoon—Practical exercise in the surgery of the mouth and maxillary sinus (anesthesia); practice in topo-

grapho-anatomical dissection (throat, mouth, and jaw); practical exercise in the surgery of the mouth and maxillary sinus (narcosis).

Fourth year. Morning—(8 to 9) Dental metallurgy; (9 to 12) practice in conservative dentistry (on the patient). Afternoon—(1 to 3) Practice in the surgery of the maxillary sinuses (anesthesia); (3 to 7) practical exercise with artificial teeth and jaws.

Fifth year. Morning—(8 to 11) Practical exercise in conservative dentistry; (11 to 1) orthodontia. Afternoon—Crown and bridge work; obturators; mandibular splints. Examinations and services as demonstrators for the students of lower years.

A glance at this curriculum shows—

(1) That a dentist who has passed through it will be thoroughly competent to deal with every case that comes within the limits of his profession; it allows—

(2) Of the student's altering his plan of study in his third year without incurring thereby any serious loss of time or material disadvantage, if he should at that stage of his career have come to the conclusion that he has no vocation for the profession of dentistry; it also makes possible—

(3) The completion of the course of study in eight terms, if the educational authorities should think fit to sanction such an education, on the ground of pecuniary difficulties, in exceptional cases.

This curriculum would have for its object the giving of exhaustive and detailed instruction, both theoretical and practical, in the following branches of technical knowledge: Theoretical lectures on the means known to dental surgery for the preservation of the teeth, and including the art of preparing and fitting artificial teeth and jaws; special surgery of the mouth and maxillary sinus, including practical exercises; practical exercises in the preservative treatment of the teeth; practical instruction in the preparation and fitting of artificial teeth and jaws; orthodontia; dental metallurgy; electrology.

The author of this report has ventured to conclude it by laying before his readers an approximate suggestion for a curriculum drawn up as a test for himself, to show whether his demands, as explained and elaborated above, could be brought into harmony with actually existing circumstances.

(To be continued.)

ODONTOGRAPHIC SOCIETY OF CHICAGO.

Fifteenth Anniversary Meeting.

THE meeting celebrating the fifteenth anniversary of this society was held February 16, 17, and 18, 1903, in the rooms of the Northwestern University Dental School, under the presidency of Dr. C. N. Johnson. It was estimated that twenty-five hundred dentists attended the sessions and clinics.

MONDAY, FEBRUARY 16TH.

The society convened in the large clinic room, and was called to order at 10.45 A.M. by President Johnson, who delivered an address of welcome.

Dr. A. W. Thornton, of Chatham, Ontario, presented Dr. Johnson with a gavel made from one of the British gunboats used in the war of 1812-13. Dr. Johnson expressed his appreciation of the historic souvenir presented to him.

Dr. A. E. WEBSTER, of Toronto, Canada, read a paper entitled "Temporary and Permanent Fillings as Barriers to Bacteria."

The discussion was opened by Dr. Jonathan Taft, Ann Arbor, Mich., and continued by Dr. G. V. I. Brown, Milwaukee, Wis.; Dr. J. N. Crouse, Chicago, Ill.; Dr. Geo. W. Cook, Chicago, Ill.; Dr. Wm. E. Heckard, Indianapolis, Ind.; Dr. Henry W. Gillett, New York, N. Y.; Dr. Oliver Martin, Jr., Ottawa, Can.; Dr. T. M. Milam, Little Rock, Ark.; Dr. J. B. Pherrin, Central City, Iowa; Dr. J. B. Willmott, Toronto, Can.; Dr. G. S. Caesar, Toronto, Can.; Dr. J. H. Woolley, Chicago, Ill.; and the discussion was closed by the essayist.

On motion the society adjourned until 7.30 P.M.

Evening Session.

The society reassembled at 8 P.M., and was called to order by the president.

Dr. MARK F. FINLEY of Washington, D. C., offered the following resolution,

which, after being discussed by Dr. J. A. Libbey, of Pittsburg, was unanimously adopted:

Resolved, That it is the sense of the Odontographic Society of Chicago, together with its guests, numbering twenty-six hundred, assembled in its fifteenth anniversary meeting, that the enlistment of dental surgeons by the Navy Department to menial positions, detailing them to do professional service, is inconsistent with the character and value of the service required, and an inconsiderate disregard of the status which is accorded the dental profession by the state laws, by the state universities and other educational institutions, by the public of this country and of foreign countries, and by the act of Congress creating an Army Dental Corps whose members are equal in professional status with two-thirds of the members of the Medical Corps of the Army; and further

Resolved, That the adoption of the pending bills on the subject, Senate No. 5419, House No. 13,968, is the least that should be done to remedy the wrong against which the dental profession is thus forced to protest.

Dr. E. C. KIRK of Philadelphia, Pa., then read a paper on "The Saliva as an Index of Faulty Metabolism."

In the absence of Dr. L. F. Barker, of the University of Chicago, who was appointed to open the discussion, Dr. Eugene S. Talbot of Chicago, by invitation, did so. The discussion was continued by Drs. J. P. Buckley of Chicago, and G. V. Black of Chicago, after which Dr. Kirk closed the discussion.

Dr. G. LENOX CURTIS of New York demonstrated an apparatus for generating ozone, after which the society, on motion, adjourned until Tuesday afternoon.

TUESDAY, FEBRUARY 17TH.

The society met at 2.30 P.M., and was called to order by the president.

Dr. HARRY P. CARLTON of San Francisco, Cal., then read a paper entitled "University Training and Dental Education."

The discussion was opened by Dr. W. H. Morgan, Nashville, Tenn., and continued by Dr. J. D. Patterson, Kansas City, Mo.; Dr. Edmund Noyes, Chicago, Ill.; Dr. G. D. Sitherwood, Bloomington, Ill.; Dr. Truman W. Brophy, Chicago, Ill.; Dr. Edmund C. French, Eau Claire, Wis.; Dr. J. P. Root, Kansas City, Kans.; Dr. C. R. Taylor, Streator, Ill.; and was closed by the author of the paper.

Dr. W. WARRINGTON EVANS of Washington, D. C., read a paper on "The Possibilities of Prosthetic Dentistry from an Esthetic Point of View."

The discussion was opened by Dr. W. M. Bartlett, St. Louis, Mo., and continued by Dr. F. H. Berry, Milwaukee, Wis.; Dr. John Q. Byram, Indianapolis, Ind.; Dr. L. P. Haskell, Chicago, Ill.; and was closed by the essayist.

Adjourned.

THE BANQUET.

In the evening a banquet was held at the Auditorium Hotel. Dr. C. N. Johnson acted as toastmaster. Toasts were responded to as follows:

1. "Professional Unity," by Dr. J. B. Willmott, of Toronto, Can.
2. "The East," by Dr. Henry W. Gillett, of New York.
3. "The West," by Dr. J. P. Root, of Kansas City, Kan.
4. "The North," by Dr. H. L. Banzhaf, of Milwaukee, Wis.
5. "The South," by Dr. D. R. Stubblefield, of Nashville, Tenn.
6. "The Ladies," by Dr. B. Holly Smith, of Baltimore, Md.

At the conclusion of the responses to the set toasts, Dr. C. E. Bentley, Dr. Geo. B. Perry, and Dr. R. Ottolengui spoke briefly.

Dr. Charles J. Sowle of Rockford, Ill., recited "The Old Grindstone."

Dr. Churchfield of Detroit recited a parody on "The Old Oaken Bucket."

At this juncture, the toastmaster appointed Dr. Geo. B. Perry and Dr. C. E. Bentley to escort the newly-elected president of the society, Dr. Fred. B. Noyes, to the chair.

Dr. Noyes was warmly received. He thanked the members for the distinguished honor they had conferred upon him in electing him president of the society.

Dr. Root proposed three cheers for the Odontographic Society, and they were lustily given.

Dr. Thornton proposed a vote of thanks to the man who had presided over the greatest assembly of dentists the world has ever known—Dr. Johnson, which was followed by singing "For he is a jolly good fellow."

After a short speech by Dr. Cyrus M. Gingrich, of Baltimore, Md., the audience quietly dispersed.

WEDNESDAY, FEBRUARY 18TH.

The society met at 10 A.M., and was called to order by Dr. Johnson.

Dr. R. OTTOLENGUI of New York read a paper entitled "A Rational Use of Porcelain in the Filling of Teeth."

The discussion was opened by Dr. W. A. Capon, Philadelphia, and continued by Dr. Wm. T. Reeves, Chicago, Ill.; Dr. F. J. Capon, Toronto, Can.; Dr. W. H. Taggart, Chicago, Ill.; Dr. J. E. Nyman, Chicago, Ill.; Dr. Edmund Noyes, Chicago, Ill.; Dr. Henry W. Gillett, New York, N. Y.; and the discussion was closed by Dr. Ottolengui.

A vote of thanks from President Johnson to the members and guests for their marked attention in listening to the papers and discussions, and for their uniform courtesy, brought the proceedings to a close.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, November 1902.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, November 18, 1902, at the Academy of Medicine, No. 17 West Forty-third street, New York city, with the president, Dr. Hodson, in the chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. GOLDSMITH. I had a case not long ago on which I would like to get a little advice. I have spoken of it to several gentlemen and have heard of one or two similar cases. A patient presented for an artificial denture for the lower jaw. The teeth in position, I think, were the six anterior ones. The part where the anterior teeth were was of gold, and that part resting upon the ridge and posterior to the canines was of rubber. The patient was unable to wear the plate, because the ridge was so acutely sensitive that it would not bear the pressure of the plate. The plate fitted perfectly, but the merest pressure on the ridge produced such pain that the patient was unable to wear it. It was suggested that the case be constructed with the semi-vulcanized rubber—the rubber used for obturators—as a cushion. I have not been able to do it because the patient would not permit me to take the impression. I would like to know whether anyone has had such a case, and whether the soft rubber has been used for it.

Dr. LEROY. The obturator rubber would help the doctor's case. I have had the same experience in a case where the absorption was so complete as to eradicate all appearance of there having been a ridge there at any time.

Dr. GOLDSMITH. The ridge in this case, as far as you could see, was very promising. There were no features that would suggest any unusual condition at all.

Dr. LEROY. I think we have all had cases where the ridge was sensitive. It

might be relieved in many instances if the semi-vulcanized rubber were used as a base. I have had it work very satisfactorily in more than half a dozen cases. One in particular was the full lower denture I spoke of at the beginning, where there was really a depression instead of a ridge. That became so irritated by contact with the plate that the patient could not wear it until the soft rubber was added.

Dr. FREEMAN. I would like to ask if this was on only a part of the ridge, or on the entire ridge.

Dr. GOLDSMITH. On the apex of the ridge.

Dr. FREEMAN. The best thing under those circumstances would be to cut out that plate and not allow it to touch on top of the ridge but have it to touch on the sides. In that way you would get over the pressure entirely.

The PRESIDENT. I have had a similar case to that, and built it up with wax, so it should not under any circumstances touch the apex. It was a perfect success, too.

Dr. WARDELL. I have had more or less trouble at the apex of the ridge, and when the plate has already been made I have taken a bur, located the spot, and cut the plate out.

Dr. EVANS. What was worn on the upper jaw?

Dr. GOLDSMITH. A full upper denture.

Dr. EVANS. If you take the teeth of that partial lower plate, and trim them off, so that there is about the thickness of tissue paper between them and the occluding teeth, you will take the pressure off those teeth. All such cases usually are constructed with clasps. You put a little claw on the side of the clasp that reaches on to one of the sulci of the bicuspid, and that will act as a brace to prevent pressure downward.

Dr. GOLDSMITH. Yes, I did make a rest on the palatal surface.

Dr. EVANS. I mean on the grinding surface, like a shelf crown. If you do that, it will remove the pressure. Ease out the marked ridge on the plate, and in a little while the membrane will become toughened by the presence of the plate; then you can make another plate, or lengthen that so the teeth slightly occlude.

PRESENTATION OF PERUVIAN MUMMIES.

Dr. HANNING (in presenting to the society two Peruvian mummies to be added to its collection of specimens). These mummies belonged to what is called the Inca tribe. We have very little history of them. At the time of the conquest of Peru by Pizarro, all records were destroyed. The Spaniards went there without any thought of conquering the natives. They were few in number compared to the Indians. It was a question of fight to live. The records show that they slaughtered the natives; the temples were thrown down and the burial-places desecrated. Dr. Finney, a graduate of the New York College of Dentistry, now practicing in Peru, managed through some of his patients to obtain permission to take out some of the mummies. Five were sent to me: three for his wife in my care, and these two. How old they are we do not know, but it is probable that they are a thousand years old. They are treated a great deal as the Egyptian mummies are. The intestines and internal organs are removed, and then they are exposed to the high and rarefied air of the mountain. It is really a drying-out process. They use no medicament or embalming process of any kind. Mrs. Finney has written out a sketch, which I will read, as follows:

"INCA MUMMIES.

"(Presented to the New York Odontological Society by Dr. J. H. Hanning.)

"*Mode of Embalming.*—Exposure to the action of the cold, exceedingly dry, and highly rarefied atmosphere of the mountains. The removal of the entrails, as adopted by the Egyptians, was practiced only in the treatment of the

bodies of the direct male Inca line, in which case the organs removed were interred some leagues back of Cuzco, the Inca capital, while the body, after a proper amount of drying, was seated in a niche in the great Temple of the Sun, at Cuzco, where it remained indefinitely in full view of the people, who looked upon it as sacred. On great feast days these mummies were carried abroad from settlement to settlement, so that all the 'Children of the Sun' might see the great fathers of their then ruling Inca. The people prostrated themselves in the dust as the sacred relics passed, in token of respect to the departed Incas.

"As the occupations in the future world were supposed to be related to those pursued while here, wearing apparel, utensils, implements of labor, and often rich treasure were entombed with the remains.

"The male line of Inca descent sacrificed wife and favorite domestics to bear the deceased company and do his bidding in the happy land of eternal rest, which was believed to await the great and good of earth.

"The postures for interment varied from the upright, or standing, to the sitting, or reclining full on the back. The most common was the sitting position, the head-often resting between or on the knees. Owing to the natural copper coloring of the body, the mummy retained a most life-like appearance, with the hair closely adhering to the scalp."

Dr. HANNING. I present them to the society to be used for any purpose they choose. They may be dismembered or taken apart, under the charge of a committee, for the purpose of examination of the teeth and jaws. One is better preserved than the other, having the hair still on it. We must be careful of damp air; if they get wet they will melt away. The principal mode of preserving is by drying out and keeping dry. I present them with the idea of comparing the dentition of that age with this. I would suggest that they be put in a case of some kind; no doubt the curator will provide for them.

The PRESIDENT. Is it necessary to

put them in a special case inside of this case?

Dr. HANNING. I do not think so, provided these cases are dry. I also have here the burial costume, or wrapping, in which these bodies are placed. The outer covering looks like a kind of burlap; the body is wrapped first in a blanket and then put in this outer covering. The colors in the blanket are remarkably well preserved. When the officials are not watching, the present-day Indians who are there rob these mummies of their blankets and wear them.

Dr. WALKER. I move you, sir, that the New York Odontological Society accept this gift from Dr. Hanning, extending to him a hearty vote of thanks. I think the mummies will add a great deal to our museum, not only in themselves but by the history connected with them.

The motion was carried.

Dr. WM. JARVIE. While Dr. Hanning was telling of the mode of preservation of the bodies it recalled to my mind an experience I had some time ago on the

top of Mount St. Gothard, in Switzerland. It is one of the highest and hardest passages to cross, and there is a hospice located there. The peasant people, going to and from Italy and Switzerland, are often lost in the snowstorms. The bodies that are recovered are simply wrapped in a large sheet, with all the clothing on, and placed in the morgue. There is no other preparation. The air up there is so rare and pure that decomposition does not take place and the bodies become mummified. The fluids evaporate and the bones and hair remain intact. You can see one of the Grenadier Guards of Napoleon, who crossed about the year 1800, with his uniform still on; the flesh is drawn tightly over the cheek bones, but the features and hair are there. It seemed wonderful to me. Quite a large number of bodies are preserved in this way. Decomposition does not take place at all, and I imagine it is by the same process that these mummies are preserved.

Subject passed.

(To be continued.)

IOWA STATE DENTAL SOCIETY.

Thirty-ninth Annual Meeting.

THE thirty-ninth annual meeting of the Iowa State Dental Society, held in Des Moines, May 6, 7, and 8, 1902, convened at 10.30 A.M., May 6th, with President Wm. S. Hosford in the chair.

The meeting was opened with prayer by Rev. A. L. Frisbie.

Hon. Joseph Dyer, on behalf of the city, then delivered the address of welcome, which was responded to by Dr. W. R. Clack.

The president, Dr. WM. S. HOSFORD, then delivered the president's address, Vice-President Fournier taking the chair *pro tem*.

The PRESIDENT (resuming the chair).

The next paper on the program will be "The Chemo-Metallic Method of Treatment of Putrescent Conditions and Filling Inaccessible Root-Canals," by Dr. P. H. JONES, Clear Lake. Dr. Jones not being able to be present, Dr. J. B. Entrikin, of Des Moines, has kindly consented to read the paper.

Dr. ENTRIKIN. Mr. President and gentlemen, you will heartily agree with me, no doubt, when I say that the man who writes a paper should read it, to get the most out of it. However, as President Hosford has asked me to read the paper, I will do the best I can for you in the absence of Dr. Jones.

THE CHEMICO-METALLIC METHOD OF TREATING PUTRESCENT CONDITIONS AND FILLING INACCESSIBLE ROOT-CANALS.

In the preparation of this paper I lay no claim to originality. I simply aim to present the method as given by the originator, together with the reasons for the "faith that is in me" and the results of some experimenting I have done in this line of treatment. If it should result in some operator's being able to deal more successfully with the class of cases under consideration, or should raise a discussion in which some good reason might be given for discontinuing this mode of treatment, the paper will have fulfilled its mission.

This method of treating putrescent pulps and filling these so-called inaccessible root-canals, was first brought before the public by Dr. George Weld, of New York city; and, judging from the infrequency with which you hear it mentioned in the discussion of root-canals, it is evident that it has not attracted any very wide attention among the profession.

When my attention was first called to this method, it appealed to me as being peculiarly adapted to the filling of those inaccessible root-canals which it is nearly impossible to fill by the ordinary method; and with this idea in mind I set about demonstrating for myself the practicality and efficacy of the method. To my mind there is no way like the old way for filling root-canals when they will permit the introduction of the gutta-percha point; but, contrary to much that you read and hear said, it is a fact that a great many root-canals defy such a method of filling. The buccal roots of the upper molars and bicuspid, the anterior roots of the lower molars—and you might include the lateral incisors, especially the lower ones—present problems, when you come to gain access to their root-canals, that the "Gates-Glidden" drill, however dexterously used, fails to solve in the great majority of cases. In an article I read not long ago, upon root-filling, the essayist said, "En-

large the small buccal roots with a drill before attempting to fill them." So far as filling those root-canals with chloro-percha and the gutta-percha point is concerned, you might just as well attempt, in the vast majority of cases, to fill them before as after using the drill, if you take doing the work effectually into consideration. If the author of that article thought he could so open up the buccal roots of an upper molar as to effectually fill them, in anything like a majority of cases, I believe he would be sadly disappointed if he were to examine his work out of the mouth. When you stop to consider the angle at which you have to approach the openings of the buccal roots of a molar, and how often the root-canal, instead of proceeding at that angle, pursues a tortuous and divergent course, the impossibility of effectually opening such a canal by any mechanical means ought to be plain to the most casual observer. Equally ineffectual will be the effort to fill many of these root-canals even when it is possible to pass a fine broach to the apex of the root. To pump chloro-percha into a canal closed at one end, and filled with air, whose diameter is so small that the finest Donaldson broach practically closes it, is a thing I cannot do.

Dr. Safford G. Perry of New York, in an article in the *International Dental Journal* for September, 1895, says: "Let us not deceive ourselves by believing that into such a minute hole, closed at one end and full of air, we can pump either of the materials in such a way as to obliterate all space. With a minute opening at the end of the root for the escape of the air it may be done, but in the mouth it is an impossibility. The only way is to leave the instrument itself." The many failures of attempts to pass a gutta-percha point to the apex of one of these canals can be testified to by, I believe, almost any operator. How many of you have had your patience sorely tried by having the point bend upon itself before getting half way to its destination, and have been compelled to complete the operation of filling the tooth, feeling that so far as the virtue of that buccal root-filling was concerned, you

might as well have saved yourself the attempt.

The idea of chemically asepticizing the putrescent contents of a root-canal is not new. Different methods have been before the public from time to time, but all of them provide alone for the cleansing of the root-canal, leaving the filling material to the discretion of the operator. Dr. Weld's method (see his paper, DENTAL COSMOS for January, 1897, vol. xxxix, p. 20) provides for both the cleaning of the root-canal and the filling of the same. It consists of the introduction of a smooth metallic point, composed principally of zinc, passed into the root-canal, and the application of a drop of modified nitro-hydrochloric acid. In the chemical action which takes place you have the root-canal thoroughly disinfected and two compounds formed: First, an oxid, which involves the metal and serves as a permanent filling; and second, the albuminate produced by the contact of the albuminoid bodies and the salts of the alloy, the disinfection of the root-canal being effected by the gases liberated, viz, nitrous acid and chlorin, either of which would be thoroughly germicidal on account of its powerfully destructive effect upon organic matter. This, in short, is Dr. Weld's method of cleansing and filling these small tortuous roots. The detail of the method, as I have used it occasionally during the past year and a half, is as follows:

First, when the pulp has been devitalized: With a fine broach remove as much as possible of the pulp from the root to be filled; then with a fine smooth broach—I generally use a "Donaldson" with the barbs removed—work your way as deep down into the canal as possible; mark your broach, so that you can tell the depth of the canal, then remove and use as a guide in selecting a sensitized point for filling. If you have not a point the size of the broach you have been able to pass into the canal, a larger one is easily reduced to the desired size. These points may be dressed down until they are mere ribbons and still possess sufficient rigidity to allow them to be pushed into place. When in position, cut it off

with a pair of scissors, allowing it to protrude sufficiently from the root, so that it may be grasped with a pair of pliers, and removed, if one should have occasion to do so. Then with a toothpick apply to the point a drop of the nitro-hydrochloric acid, and you have a root-filling which, for the obliteration of space and permanency of asepsis, I do not believe can be excelled for cases of this kind. Do not understand me to claim that by this method all root-canals can be filled, for that is an impossibility let the method used be what it may. But I do claim that, wherever you can pass a fine smooth broach, one of these sensitized points will follow its course. Neither would I give it precedence over the chloro-percha and gutta-percha points, when they can be used. I have used these points in fifteen cases during the past year and a half, and no trouble has been experienced with the exception of one case. This was a case of a "blind abscess." The tooth affected was an upper bicuspid, and had given the patient trouble periodically for over a year. After an extended treatment the tooth was filled, using gutta-percha for the palatal root and a sensitized point for the buccal. About a week after completing the operation the patient returned, complaining of a severe pain in the apical region of the tooth. Local treatment doing no good, the tooth was extracted. The buccal root was the seat of a large abscess, and had been absorbed to the extent of one-sixteenth of an inch. The metal broach was found protruding from the end of the root about one-thirty-second of an inch. I have always had my doubts about the metal point being the cause of the trouble.

Second, when the pulp is in a putrescent condition: I would hesitate to thrust one of these points into a root-canal filled with putrescent matter, for fear that in so doing some of the septic matter might be forced through the apical foramen. If one of these points could be introduced into a root-canal in this condition without forcing some of the contents into the tissues beyond, I have not the slightest doubt that the application of a drop of

the acid to the point would thoroughly sterilize the contents of the canal. In such cases, I grasp the point in a pair of pliers, and after dipping it into the acid, pass it slowly into the root-canal for a short distance, holding it there until chemical action ceases. Then I withdraw it, and, having by means of a disk removed the oxid which has formed upon it, I repeat the operation. This is continued until the point has been passed as deeply as possible into the root. It is then withdrawn, cleansed of all deposits, replaced in position, and a drop of the acid is applied.

Two cases come to my mind right here that may be of interest. One is that of an old German woman, who desired an upper right lateral filled. Upon examination I found the pulp putrescent. I tried to explain to her that the tooth would have to be treated before I could fill it. She insisted on having it filled then and there. Thinking this would be a good case in which to try Dr. Weld's method, I proceeded to act. Placing one of the points in a broach-holder, I wrapped a few shreds of cotton around it, and, dipping it in the acid, wiped the root-canal out thoroughly. I repeated this operation three times, each time removing the oxid from the point. The canal was then dried and filled. A week later the patient reported that the only inconvenience she had experienced was a slight soreness of the tooth the day following the operation.

The other case is that of a young man the pulps of whose upper central incisors were in a putrescent condition. These were treated exactly as the case which I have just related, and the canals filled at once with chloro-percha and a gutta-percha point. There has never been the slightest evidence of any trouble since the operation.

The little experimenting I have done during the past year has been so satisfactory, personally, that I shall continue to use this method of treatment when the proper cases present themselves, and any report of my work that may be desired in the future I will gladly give.

Let me anticipate a few questions.

What would be the effect if one of the broaches should be left protruding from the apical foramen? Stephenson was asked, "What would happen if a cow got on the railroad track in front of the engine?" He replied that "it would be bad for the cow." Stop and think how few of the really difficult root-canals have the foramen open sufficiently for such a thing to occur. About one in ten, it is claimed by those who have done investigating along this line. If an operator lacks the delicacy of touch which all dentists are supposed to possess, and drives away at his work regardless of all indications of pain on the part of his patient, he will very likely come to grief if he uses this method. "Will not the acid attack the tooth-substance?" The acid will attack the substance for which it has the greatest affinity, which in this case would be the sensitized point, although it is reasonable to suppose that the contiguous tooth-substance would be somewhat affected.

Discussion.

Dr. W. R. CLACK. The point that the essayist speaks of, or that he quotes from some other author, in regard to enlarging the root-canals by the use of a drill, I have not found very practical. It always seemed to me that the drill forced so much débris in front of it that it was almost impossible to introduce your broach sufficiently to remove that. All the enlarging I have had to do I have been able to do with a broach. It takes quite a little while, but I believe one would succeed better by that method than in trying to drill the tooth and then to remove the débris from in front of the point of the drill.

Dr. Lewis of Austin, Minn., was in my office the other day and noticed me trying to pick the cotton off the end of a barbed broach by which I had been carrying some oil of cloves into a root. He said, "Let me show you a thing that Dr. Searl of Owatonna put me on to." He took a smooth broach, held it a moment in the flame, touched it to a piece of beeswax, and wrapped the cotton around it. The idea is a good one. You

can carry the cotton to the end of the root, give a slight rotation of the broach, and leave it there, or, holding on to the shred, you can remove it with the broach, and remove it instantly. Try it.

Dr. FRANK FOURT. I would like to ask Dr. Clack if he knows how these metal points are made, of what they are made, or whether they are ready-made.

Dr. CLACK. I think that I know enough to say that they are ready-made, and that he selects them to suit the case. He would have sent down by me some samples, but he had run out of points without knowing it and was unable to do so.

Dr. C. E. LAIRD, Des Moines. I want to just emphasize what the doctor spoke about here in regard to the little broach, as being the best thing I have ever seen for getting into these inaccessible places which you cannot get into with anything else; and Dr. Clack did not quite answer the gentleman's question as to what these broaches are made of. Do you know, Dr. Clack?

Dr. CLACK. I do not.

Dr. LAIRD. And what is this acid composed of?

Dr. CLACK. I have not the formula. The paper gives it.

Dr. ENRIKIN. I would like to say that the broach is composed principally of zinc, and a drop of modified hydrochloric acid is placed on this little point, applied into the canal, and carried down to the apical foramina. The points, I take it from the paper, are composed principally of zinc.

Dr. BAKER. Didn't you say nitrous?

Dr. ENRIKIN. I believe the paper states hydrochloric acid used in connection with the zinc points.

Dr. J. B. MONFORT. I would like to know if there is anyone in the room who has ever used these points? It is something new to me. I never filled a root with any metal point except one, and that was the point of a Donaldson broach. (Laughter.)

Dr. C. L. TOPLIFF. In regard to this method under discussion, and asking for some points, I will say that I have a root in my mouth filled by this method. It

has been there about a year and a half, and it is perfectly satisfactory so far, and that is all I can say about it. It was a putrescent pulp at the time of filling and there was considerable soreness and inflammation to start with.

The PRESIDENT. The next paper will be the "Administration of Nitrous Oxid and Oxygen for Dental Operations," by C. F. DWIGHT, D.D.S., of Marcus.

ADMINISTRATION OF NITROUS OXID AND OXYGEN FOR DENTAL OPERATIONS.

It is not necessary to enumerate in this paper the many obstacles with which "N₂O" came in contact during its long struggle for existence. It was discovered by Priestley in 1774. In 1800 Sir Humphrey Davy discovered its exhilarating effect, and in 1844 Dr. Wells, an American dentist, discovered its anesthetic property. It is obtained by boiling ammonium nitrate and collecting the vapor therefrom.

Until the last few years each dentist who used the gas must have an apparatus for its manufacture, which fact in itself was detrimental to its use, and for these reasons: It was next to impossible to produce it in a pure state; and further, the gas was not uniform in quality, but varied so as to make results uncertain. Now, however, we are able to produce it in a liquid form absolutely pure, making it much more convenient and reliable. These were very important reasons why N₂O met with so many rebuffs.

One other very important reason was that there was no convenient or properly adjusted apparatus, and, I might add, that a very limited knowledge prevailed as to the principles which should be followed in its administration. It may readily be seen that with the gas impurely prepared and with the crude contrivances used for its administration, there resulted a mixture of no one knows exactly what, only that it contained N₂O, but in what quantities we cannot say; that N₂O, however, contained true anesthetic properties there was no doubt.

It was not until 1868 that Dr. Evans devised an apparatus to prevent rebreathing and exclude atmospheric air. This

was good, and Dr. Evans comes in for his share of the glory. It was quite right to exclude atmospheric air and prevent rebreathing, but this, while it overcame some of the difficulties, was still lacking, inasmuch as in giving the pure gas certain asphyxial phenomena arose which made a long administration impossible; or, to use the language of one very eminent man, "The pendulum had swung too far in the other direction." This, however, served its purpose, as it led to various experiments by Professor Bert Martin and others, their method being by the admission of oxygen to eliminate the asphyxial element of the N_2O , thereby making it possible to prolong the administration considerably and also to prolong the anesthesia.

These gentlemen, as nearly as I can learn, never succeeded in constructing a practical apparatus which was convenient, portable, and provided with an oxygen regulator, and it was not until within the last few years that Dr. Hewitt of London succeeded in producing one that possessed these requirements. The oxygen regulator enables the anesthetist to increase or reduce the proportion of oxygen to meet the requirements of the patient. I have never seen a Hewitt apparatus, but have one made by The S. S. White Company which is adapted to his method.

Preparation of the Patient for Anesthesia.

First of all about three or four hours should elapse after eating; stimulants should be avoided; everything should be in readiness before the patient enters the operating room so that no time may be wasted and the operation may be commenced without the patient becoming nervous.

An Adams and a Nevius mouth-prop, tongue forceps, and a bottle of amyl nitrite, a "hypo" loaded with one-quarter grain strychnin,* and a glass of cold water should be at hand.

*This quantity is more than seven times the normal dose of strychnin and its administration would be dangerous if not fatal.—Ed. COSMOS.]

A third person, preferably a lady, should be present throughout the operation. All tight or constricting clothing should be loosened, it being imperative, in order to get good anesthesia, that the patient take deep full breaths, the air in the lungs giving place to the anesthetic.

It is desirable that the patient assume a comfortable position. If it be necessary to tip the chair backward, do so just before removing the face-piece or inhaler.

If relatives or friends are present it is always better for all concerned to have them remain in an adjacent room; but if the patient insists upon their presence they may be allowed to remain in the operating room until the patient begins to approach anesthesia, when at a given signal from the anesthetist they may depart unnoticed by the patient.

Do not think that these preliminaries will have a disturbing influence: on the contrary, I think their observance has a reassuring effect and will make the patient realize that you are looking after his welfare.

After all is in readiness and the patient is comfortably seated in the operating chair, adjust the mouth-prop and place the inhaler over the face, telling him to breathe naturally and that he will inhale only air at first; also tell him to count the clicks of the expiratory valve assuring him that regular clicks of that valve indicate a good breath. After a few breaths of air the patient will become quiet. Then close the air-valve, at the same time opening the N_2O valve. In this way the patient seldom realizes when he really begins to take the gas. After two or three breaths of the N_2O open the oxygen regulator one point, then, after two or three more breaths, open to the second point, carefully watching the patient, as no two will require exactly the same amount of oxygen. Gradually increase the percentage of oxygen until 6 or 7 is reached on the indicator. If there be any indications of asphyxia, add oxygen a little faster. On the other hand, if you have been giving oxygen too freely, turn the indicator back to 3 for a few breaths only, then return to 6 or 7. Do not leave the indicator at 3 or 4 more

than three or four breaths, for you will have gone too far in the asphyxial direction. After a few more breaths at 6 or 7, gradually work the indicator up to 10 if possible. Some patients will not tolerate a great proportion of oxygen, but always reach the highest point possible on the indicator, and if no excitement occurs leave it there until the desired anesthesia is reached. This is characterized by softly snoring breathing, a good pulse, a good color, an insensitive ocular conjunctiva, relaxed eyelids, and an absence of muscular rigidity in the extremities.

Occasionally, after the patient has been breathing heavily or the anesthetist has been giving too great a proportion of oxygen, the respiration may cease completely for a short time, which need cause no alarm, as it will regulate itself as soon as the oxygen has been reduced.

The pulse always remains a trifle faster than normal all through the administration. The initial acceleration from nervous excitement gradually increases to a maximum and then gradually falls to a little above normal and remains so.

Dr. Hewitt, who has given the mixture thousands of times, says he has never met with a case of circulatory failure.

Usually the eyes are closed, but some patients prefer to keep them open when the inhalation begins. As it proceeds the globes gradually cease to fix themselves on surrounding objects, and the lids may be opened or closed at the will of the operator.

I have had one case in my own experience where the patient could not be induced to keep her eyes closed, and during the entire operation she had her eyes fixed on my assistant. This led me to believe that I was not getting the desired anesthesia and caused me to reduce the oxygen and prolong the inhalation somewhat. After a very few breaths, I observed the approaching symptoms of ordinary N_2O narcosis, the patient still eyeing my assistant. At the same time I found an insensitive ocular conjunctiva and immediately proceeded with the ex-

traction, being able to get eight teeth, the patient experiencing no pain whatever. That was an exceptional case and the only one of the character I have ever had.

It takes nearly twice as long to induce anesthesia with the mixture as it does with N_2O alone, and a corresponding amount of gas. The juncture at which the inhalation must stop depends upon the nature of the operation, as the more deeply anesthetized the patient is, the longer the anesthesia. It is estimated that anesthesia from N_2O and O is twice as long as that from N_2O alone.

The success in administering anesthetics is largely due to the power of the anesthetist to foretell which is the best method to pursue.

With only one class of patients do I think it permissible to begin the inhalation with any great amount of oxygen, and that is with children, and then only when the child is inclined to cry. In those cases the oxygen indicator may point to anywhere from 4 to 7, depending on condition. This provides for the asphyxial element induced by crying.

Dr. Hillischer of Berlin—a very eminent man, by the way—begins inhalation with about twelve per cent. of oxygen. With this method he has great excitement, and it is necessary to have the arm-strap and strong assistants. However, after the exciting stage is past, the patients enter a state of good anesthesia. I prefer to use as much oxygen as possible and yet get good anesthesia, avoiding the exciting stage accompanying the system of Dr. Hillischer.

The better the condition of the patient's health, the more of the mixture required to produce anesthesia, and it naturally follows that a slightly smaller percentage of oxygen is required.

Taken as a class, women are better subjects than men. They will tolerate a greater proportion of oxygen, and being less muscular are less liable to inconvenient muscular rigidity and movements.

Alcoholic subjects I may safely say are the worst we have to handle, and my experience with them has been very un-

satisfactory, to say the least. I have found that they will tolerate a very small amount of oxygen and the period of anesthesia is very short. In one special case it was necessary to cut off the oxygen altogether, and the anesthesia was not at all satisfactory, as it was so short that it was only possible for me to extract two or three teeth at each administration.

Anesthesia produced by the mixture available for a dental operation begins at the moment the face-piece is removed, and should be regarded as terminated at the first sign of returning consciousness. Nothing has done more to create an unfavorable impression regarding N_2O than the practice of continuing the operation when the patient is emerging, or has emerged, from deep anesthesia. At this stage, while the sensation of pain is not acute, the patient realizes what is being done, and the shock from fright is quite as bad as with no anesthetic at all. So I consider it best at the first sign of returning consciousness to discontinue the operation, allow the patient to fully recover; rinse the mouth, rest for a few minutes, and then administer the gas a second time. I find this method better than to reapply the face-piece before consciousness is fully restored, for it dispenses with any struggle which is apt to ensue and blood is not so likely to be swallowed, thereby avoiding nausea.

I have repeated the inhalation as many as five times without the patient leaving the chair. That was in a case where there was only one whole tooth remaining, all the rest being roots, and nearly every one overgrown by the gum, making it very difficult to extract them. The patient experienced no nausea, and no inconvenience of any kind except, of course, a very sore mouth, which would naturally follow, and as soon as the bleeding had stopped sufficiently he left the chair and walked home.

Unfortunately there is no rule one can follow in all cases, and the best one can do is to use his judgment, at all times using as much oxygen as is possible and yet obtain good deep anesthesia, thereby inducing as long anesthesia as possible.

My own experience with N_2O and O convinced me that when properly handled we have in the mixture a very valuable anesthetic for dental operations.

Discussion.

The PRESIDENT. Dr. C. R. Baker will open the discussion on this paper.

Dr. BAKER. Mr. President, I want first to compliment the gentleman on his paper and on his thorough handling of the subject, and then I want to say that I think we are drifting back through the years to an old friend. Nitrous oxid, as some of you may remember, was the first general anesthetic that was discovered and used for that purpose, but, as the essayist has said, the dentist was unable to use the gas, because of the impure products with which it was contaminated, it being personally made by each man that used it; in this way it was not rightly prepared for the scientific administration, so that it was discarded, and replaced with anesthetics that are more generally used at the present time, as chloroform, ether, etc. But dentists—even we, in our own practice for many years—were using nitrous oxid and administering it very freely and without thought, although finally many discarded it and took up local anesthetics, as they will take up any new thing,—we are very apt to do this; yet now we come back to nitrous oxid, because we have discovered that these local anesthetics do not satisfactorily answer the purpose, and that nitrous oxid can be administered in a scientific way.

Now, not only is this a point with nitrous oxid, but with other anesthetics. A gentleman was talking to me this noon to the effect that this is only a demonstration of Dr. Hewitt's idea that by the administration of oxygen or air with the anesthetics we have a more scientific anesthesia. Now, the manufacture of this gas was for many years, as I have said, a makeshift, and the contaminations that were found in it were from overheating, making nitric oxid instead of nitrous oxid; this was a great detriment to its use. And then the method of administering it, of breathing over and over

again the same gas, was also a thing that was, if nothing more, rather disgusting.

In the appliances used for this purpose, it was many years after the use of gas was commenced before the appliance was made by which they could inhale the gas, and exhale it through the open air, and when that was found the gas was used to a much greater extent.

Then there was a discussion for many years as to the true anesthetic property of nitrous oxid, until in England Dr. Bird, the champion of the anesthetic powers of nitrous oxid, proved conclusively that it is a true anesthetic. Dr. Bird's experiments were very interesting. Dr. Dwight has said very little about them, but the main idea was that, if the gas were administered so that the proper dose could be received into the circulation, the blood could be made to dissolve a sufficiency of nitrous oxid together with the proper amount of oxygen to keep up the oxygenation, and the anesthetic could be administered without any sign of asphyxiation. For this purpose he contrived a chamber into which the operator, as well as the patient, entered and then created a pressure, the gas being under this same pressure, so that more of a dose could be given in a short time,—before the first portions of the gas could pass off. In this way he was very successful in both dental and surgical operations performed by different surgeons and dentists, and I believe those chambers are still manufactured over there to some extent. That was the first idea as to the administration of oxygen and nitrous oxid.

But other experiments with the nitrous oxid were also made in combination with atmospheric air. Now, in this way it was possible to keep a patient under the influence of the gas—that is, I would not say to keep the patient completely under the influence of the gas, because the gas was given, the patient brought under its influence, and then a few breaths of the atmospheric air allowed, and the patient would begin to recover; then, as soon as any signs of restoration were observed, more gas would be administered, keeping the patient just under

the influence of the gas in that way for—well, in 1882 I was in an office in St. Paul and the gentleman there was in the habit of administering gas in this way to patients for almost half an hour, and an operation was performed very nicely without the slightest after-effect upon the patient any more than we have in our dental operations. At that time I administered the gas many times myself during the summer when the man whose office I was in was abroad, and I had very good success in that way, yet it was not free from a slight asphyxia.

In this way, and with these chambers, Dr. Bird demonstrated the true anesthetic properties of gas, and he was the first one to demonstrate the fact. But with his use of nitrous oxid, as far as we can learn, in using the oxygen he would administer—that is, when not under usual pressure—too large quantities. His administration of the mixture of oxygen and nitrous oxid was an indefinite one; he had no apparatus by which he could change the percentage of oxygen administered, so that if he started with one per cent. he had to keep on with one per cent. And I want to say that the main thought, and the main success of the administration to-day of the combined gases, is the bringing of the patient under the influence of the nitrous oxid first; administering enough to start with to begin the anesthesia, and then keeping it at that point by the use of a small quantity of oxygen—about seven to ten per cent., whereas they used as high as fifteen to twenty per cent. at the time of these experiments.

Now, the doctor speaks of the preparation of the patient, and I do not know that I can add much more to what he has said, except to say that in so far as I have had experience with the administration of nitrous oxid I have seen very little trouble from nausea. I remember of but one patient that had any trouble in this way. As to the patient using stimulants, that is one of the principal points, I think, of which we must be careful. I have had patients whom I knew had used stimulants before applying for the administration of gas, and

have refused to administer gas in some; in others, while I would think, "Well, we'll go ahead with it this time anyway and see how it goes," I have wished afterward that I had not. In one case, only a short time ago, I went out with several physicians who wanted me to administer the gas, and, of course, just before the operation they gave a good big dose of brandy. I did not say anything, for they got most of it down before I came into the room and saw what they were doing. I was afterward very sorry that I had administered the gas at all, yet I had not the effects that we generally look for—that is, too much stimulation and excitement—but it took an unwarranted amount of gas to bring the patient to the proper condition for the operation, and when he was finally brought to that point it was very hard to tell just what was his condition. The doctor related in his paper that he had one case in which the eyes of the patient remained open; well, this case was very much of that same kind, and I must confess that I was very much deceived by this one thing. You could not tell from the complexion, especially, that the stage of asphyxia was approaching, and before I knew it I had given more of the gas than I should, and asphyxia and the rapid pulse were upon me.

The preparation as to the clothing being loose, as spoken of, is a very important one. And there is one other point: If anyone here has a case of this kind he will find that there is an opportunity to show his power of hypnotism. I have not much of it myself—have wished I had, many times. The power of suggestion is a wonderful help in these cases. If you can tell the patient, "Now you are in such a state; now you feel such and such a condition in the extremities. The circulation is in such a condition, and you are very nearly under the influence of the gas." Just suggest these things—that the patient is going to sleep, for instance—and you will find that it helps out a great deal.

I spoke of the pulse becoming rapid. In the administration of gas the pulse is exhilarated very slightly through the

whole operation. At first you may find it a little faster and stronger than it was before the administration, but it slows down to some extent, so that it is almost but not quite normal, as the patient comes under the influence of the anesthetic. Then, if you carry your anesthetic to too great an extent the pulse is exhilarated to a wonderful degree. That is caused by lack of oxygen in the blood, and that is the one thing where the administration of the pure oxygen is the most beautiful thing. You can keep that oxygen supplied and get enough gas to make anesthesia, but it will guide you in giving more oxygen if you find the pulse increasing in rapidity; and never carry it beyond that. If you find the pulse coming to that point, stop your gas and give oxygen or air, whatever your apparatus may be. The amount of gas administered in this way, or even with the administering of air and gas, will be more than doubled, I think, and it will take quite a large amount.

Now, if there is any consideration of expense at all—of which, of course, there is very little in its use in dentistry, because all we want is to bring the patient under its influence, and then we are through—but in long operations for surgical purposes it is a different thing. Where they keep a patient under the influence of the nitrous oxid and oxygen for, you may say, from half an hour to an hour and a half, anything of that kind, the expense of the gas is considerable. It is the most expensive anesthetic that we can administer, and yet if the time is considered that is used by the operators or by surgeons, or others, it is cheaper in the end.

The length of the influence of this anesthetic, used in this way for our own purposes, is a great point that is to its advantage. The length of time of anesthesia, using the nitrous oxid and oxygen, is at least double. So we have a great advantage to gain. We can extract and can take more time to the extraction and the operation than we could in any other way.

In the January 1902 *Cosmos* there was a paper on the administration of nitrous

oxid under pressure, which seemed to me to be a very nice thing. It was given, not through a mask, or through a mouth-piece, but by the tips that throw a jet of gas into the mouth or nostrils. This is kept at a pressure so that they get enough air and enough gas to keep the patient under its influence, using it much the same as the nitrous oxid and the oxygen apparatus. I had never heard of the method before, but the writer seemed to be the inventor of the apparatus, and it seems to me that it would be a very good thing provided it works as he says it does.

The doctor speaks of discontinuing the operation as soon as there is the first appearance of consciousness. Now, that may be a very good point, but I should think that in some operations it might be explained to the patient thus: "Now, this is a little more of an operation than it may be possible to do without your knowing anything about it." You know that very often we have patients who have taken an anesthetic and who will say they knew all about it and it did not hurt them at all, and these fear, when they begin to return to consciousness and know you are still operating, that it will hurt. Now, if it was explained to a patient that they might possibly be conscious of what you were doing but that you want to continue the operation so as to finish it with one administration of gas, it would not be as much of a detriment as you speak of.

The essayist spoke of repeated administrations of gas. I have never seen any ill effects such as he speaks of from the repeated administrations of gas, although I have administered it several times in succession, allowing the patient to come fully to consciousness and recover thoroughly.

The anesthetic properties of gas and oxygen I think are going to be more thoroughly understood and used by general surgeons than has ever been the case hitherto, and the surgeons and the medical journals are taking up the scientific experiments with nitrous oxid more than they have ever done. Heretofore there have been very few physicians who knew anything about nitrous oxid, and when you administer it in their presence they demonstrate the fact of their ignorance very decidedly, and you can see that it was the first time they have ever even thought of the subject of nitrous oxid. But to-day their journals and their societies are considering the anesthetic properties of nitrous oxid, and when we have it under control thoroughly by the use of oxygen with it, I believe that we will be called upon more and more to administer nitrous oxid for the general surgeon.

Dr. CHAS. F. DWIGHT. There is only one thing that I wish to speak about, and that is: Dr. Baker spoke of reapplying the face-piece or inhaler to prolong anesthesia before the patient had fully regained consciousness. This I do not consider a good plan, as the patient in that semi-conscious condition is apt to think that when the inhaler is reapplied the operator is trying to extract more teeth, and it occasions more or less of a struggle, during which blood is swallowed and nearly always produces nausea. I consider it better, as stated in the paper, at the first sign of returning consciousness to desist from the operation, and after the patient has fully recovered, and has had time to rinse his mouth, and the bleeding has been partially stopped, to then administer it a second time.

(To be continued.)

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EDITORIAL DEPARTMENT.

“QUALIFICATIONS FOR PRACTICE.”

WE publish elsewhere in this issue a thoughtful presentation of this subject in an article recently read by Dr. Arthur Holbrook before the Milwaukee Odontological Society, and, with the author's consent, we desire to discuss here some of the points which he contends are desirable in the education and training of the student to properly equip him for dental practice. Let us state frankly at once that in so far as the author of the paper in question appeals for higher standards of qualification for the dental practitioner we are in entire sympathy and accord with him, but some of the methods which he so strongly advocates for the attainment of that end we believe are not wisely chosen from a practical educational standpoint. In short, we are in agreement with his desired ends, but not altogether with his proposed method of attaining those ends.

In the first place, we believe that the natural normal limit of preparation for entrance upon the professional course of study in dentistry, at least under the present conditions, is the termination of the high-school course. Dr. Holbrook contends that the proper preparation for the professional course should be at the termination of the college course, for the reason, so far as we are able to ascertain from his paper, that “the college man is prepared and equipped for any calling,” and, by inference, the high-school graduate is not. We freely admit that it is generally and popularly believed that a college education does equip and fit a man for any calling

in life in the sense that he is prepared by such preliminary training to intelligently take up the special education or training which is to be the calling or profession of his choice. We are inclined, however, to doubt the soundness of such a conclusion, both on logical grounds and, so far as dental education is concerned, from practical experience. We have for years contended that the preparatory training for dentistry must be a more or less specialized training in order to produce the best educational results. It is not *how much* the student knows which is the fundamental question, but *what he knows* that qualifies him for the study and practice of dentistry, and in fact for any profession, and it is in our judgment a fundamental error to assume that a given amount of training or knowledge, regardless of the kind of knowledge involved, will fit a man for entrance upon any calling in life. It is upon what we regard as the mistaken theory just stated that the Regents of the state of New York have heretofore based their standard of preparedness for admission to professional study in medicine, dentistry, and law, but which basis has recently been undergoing correction in the light of the recognition of the fact that the kind as well as the amount of preparatory training must be taken into question in deciding upon the fitness of the student to enter upon professional study in the directions referred to. We hold that all education is essentially a means to an end, and therefore that the amount of time and energy necessary to the attainment of a degree in arts or letters at the termination of the college course, so far as its value as a preparation for the study of dentistry is concerned, is time and energy almost wholly lost unless the kind of college course upon which the degree in arts and letters has been acquired is one so selected as to its character as to be in line with dental professional training and adapted to the development of those qualities of mind which will be called into requisition in successful dental practice. When the college training is so adapted, and where the collegiate degree represents the completion of a preparatory course which is literally preparatory to the better understanding of the dental professional course, then, and not until then, do we believe the pursuit of such a college course would be conservative of the best educational ends so far as dental professional training is concerned.

We have said that we believe the normal, natural preparation for the study of dentistry should be the completion of the high-school course. We do not mean by that that it is at present in all cases the ideal preparation; far from it, but it should be made so for several reasons. In the first place it represents the termination of the period of study and training which the average young man can afford to take, and, otherwise expressed, it represents the average education which the state makes available for its citizens. Those who are able from an economic standpoint to avail themselves of the opportunities which the state affords for higher education

are relatively limited in number, and it is under present circumstances impracticable, as it would be unjust to the majority to exclude the great body of young men from the opportunity for professional study by placing the standard of admission to dental colleges at the plane of college graduation instead of high-school graduation. The entrance to schools of medicine, dentistry, and law should be articulated with the termination of the public school system, viz, high-school graduation, in order to give a fair opportunity to the greatest number to pursue the lines of professional study. We admit that the criticism of lack of adaptation as a means of preparation for dental professional study applies to high-school preparation, to some extent, as it does to college preparation for the same end; but the difference is not so marked in the former as in the latter, the college courses in arts and sciences being more diversified than are the courses of training in the several high schools. Dr. Holbrook's contention, if we clearly understand his position, favors college preparation because after such preparation the student brings to his professional studies a mind more highly cultivated and trained in habits of study and methods of logical reasoning, which we freely grant. We hold, however, that these qualities can be and should be developed in the high-school student sufficiently for all practical purposes, and that, where they are not, the fault is in the methods of teaching employed in the high school and not simply because the mind of the student is immature. Where he lacks mental qualification as a high-school student the fault is in the method of his training, not in the grade of work which he has been doing as a high-school student.

The essential reason why it is practically objectionable to require the college training preparatory to entrance upon dental professional study is that formulated by Sir Michael Foster in his memorable Cambridge address in 1901: "The mind grows old very slowly and can be educated even late in life; but the body becomes old very soon and it is necessary to train it while it is really young." There is no calling in life where it is more essentially true that the student must "do the work in order that he may know the doctrine" than it is in dentistry, and in order to acquire that facility in the manipulative phase of dental art which is so necessary to its successful practice it has been found by practical experience that the muscular training of the student in the manipulative procedures of dentistry must be undertaken at an early period in life, before he could have completed the ordinary college course as preparatory to entrance upon dental professional study. While the necessity for manipulative training is generally admitted by dental educators and by practically all who have given attention to the question, there are those who contend that in the laboratory training of the students in scientific courses a sufficient amount of manipulative training is received to compensate for the

postponement of the actual dental training until after college graduation. We doubt the validity of such a conclusion for the reason that there is no substitute for the special manipulative dental training which is so effective as dental training itself, just because there is no imitation which is so genuine as the real thing. It is this manipulative impress which must be made early in the student's career, and the importance of it is sustained by practical experience as well as by physiological investigation. If it be postponed unduly, no amount of training will confer the required muscular control and facility required in operations, nor will any amount of intellectual acuteness compensate for its absence in the practitioner. We are in strong sympathy with the contention of Dr. Holbrook that the college graduate brings to his professional work a mind more thoroughly prepared to absorb the scientific training of the professional course. We, however, contend that the high-school graduate, when his teaching has been properly conducted, brings to the professional course a mind which is sufficiently well trained for that purpose, and when we consider the mental cultural value of the dental professional course itself, simply as a means of intellectual training, we believe that the graduate should be mentally qualified, both as man and practitioner, to suitably fill the position in life for which he has been trained. It must not be forgotten that all educational standards must be based upon a fair minimum attainment to be capable of practical application. It is not difficult to formulate ideal standards which would be Utopian in practice. We must be content with the attainable in education and not attempt the impossible.

The question of the mental development attained by preparatory study is one which depends largely upon the teaching methods employed, in which respect we are inclined to believe from considerable experience and observation that American preparatory schools are open to criticism. The tendency to short cuts in education and the feeding of immature minds upon predigested knowledge and the minimizing of the disciplinary element in education, which leads the student to depend upon the authority of his teachers rather than upon the results of his own reasoning processes, has led to the production of a habit of mind which depends upon memory for its knowledge rather than upon the reasoning faculty.

When the high-school system of the country is able to deliver to the professional schools graduates who have developed reasoning powers from the discipline of properly directed study and the ability to think independently commensurate with the normal age of high-school graduation, we are of the opinion that such high-school training will be found amply sufficient as a preparation for entrance upon professional study in dentistry, so that the student may enter thereon at a period of life when he is yet young enough to profit by the technical training of the dental course,

and at the same time will be old enough to profit by its scientific training as well.

Dr. Holbrook contends that the college graduate should receive a time concession in the dental professional course because of his superior preparatory training. As it is manifestly true that no part of the modern dental curriculum can be substituted on an equivalent basis for any part of the college preparatory training, we take it that this suggestion for a time consideration must be based upon the assumption that the college-bred man will be able to compass the training contemplated by the dental course in less time than the high-school graduate, and that we believe to be a mistaken assumption. It is probably true that the college graduate, provided his college course has been a scientific one, or even possibly a course in arts, will more quickly understand and assimilate the theoretical and scientific elements of the dental curriculum, but the same cannot be said of its manipulative training. We must keep in mind constantly the difference between knowing how to do a thing and the ability to do it. There is no evidence to show that the college graduate would learn to play a violin or piano any more rapidly than would a child—in fact, the experience of those who have made musical training a life profession is to the effect that skillful performance upon the instruments named is only possible to those who have begun their training very early in life, and that no great musician, in the sense that he is a performer upon musical instruments, has ever been created late in life. On the other hand, it is possible to acquire a theoretical knowledge of music, musical perception, and a scientific knowledge of harmony late in life, quite apart from the power to execute what the mind has learned; when, however, we think of a musician we naturally think of one who is proficient in instrumental technique. Therefore we believe it is a much more practicable method of education in dentistry to erect the scientific and theoretical superstructure of dental knowledge upon the basis of high manipulative attainment acquired early in life than it is to create even a little better intellectual dental attainment upon a mediocre basis of manipulative skill, or no skill at all, for it is the former that makes the most suitable and efficient dental practitioner. If a college preparation really possesses superior value for professional training, then the increased efficiency of the college-bred practitioner should be sufficient compensation to him for the time spent in college by giving him just that much advantage over the practitioner whose preparatory education was obtained in a high school.

Dr. Holbrook's comparison of the relative numbers of college-bred men in medical and dental schools respectively, to the detriment of the latter, is doubtless correct, but his reasons therefor do not seem to us to apply to the case. Dentistry is a younger profession, and the attainment of its practitioners has not on the whole reached that point in the public esti-

mation which popularly places the dentist on a par with his medical *confrère*. The issues of life and death are not so frequently committed to the care of the dentist as to the physician, and he is not brought into the same kind of relationship with his *clientèle*, and does not stand so distinctly before the community as a dispenser of life and health, or as a reliever of human suffering—he is not in the same sense a public benefactor, at least from the public standard, so that the inducements of high social position, of public honor, or of personal aggrandizement offered by dentistry are not so great as those offered by medicine, hence dentistry does not attract to its ranks as many men who are willing to make large personal sacrifices for the emoluments and honors which dentistry offers to its practitioners as does medicine. Its rewards are less, hence the sacrifices necessary to attain them are also less.

We believe that the time is approaching when the successful and intelligent practice of dentistry will require as thorough preparatory training as does medicine—in fact, it requires such training now—but we believe that the higher educational end will be attained not necessarily by requiring a heterogeneous education, such as may be obtained in the pursuit of the many courses leading up to the degrees in arts and sciences, but by a specialized training best adapted to fitting the dental student for his professional course and one which will develop those elements of character which go to make him a self-respecting, self-sustaining, independently reasoning member of the community as well as a highly trained technical practitioner of his profession.

THE PRACTICE OF DENTISTRY “WITH FORCE AND ARMS.”

THE Supreme Court of Georgia, December 10, 1902, has handed down an opinion rendered by Judge Candler confirming the constitutionality of the act regulating the practice of dentistry in that state, approved February 15, 1897. The case was one on appeal from the ruling of the court below in an indictment for illegal practice of dentistry and had been tried before a judge without a jury and the accused found guilty. The defendant's counsel at the close of the hearing moved to dismiss the accusation on the grounds that the act on which the accusation was founded was unconstitutional, the reasons alleged being—(1) That the body of the act contains matter not referred to in its title; (2) That it relates to more than one subject-matter; (3) That the title is silent as to any penalty, and is totally lacking as to containing or establishing a criminal offense; and (4) That the act attempts to create two separate and distinct classes of misdemeanors, as shown by sections 7 and

9 thereof. The court overruled the motion to dismiss and granted an exception to the accused.

The Superior Court in reviewing the case held that because the dental law of Georgia prescribes in the body of the act penalties for violations of its provisions not referred to in the title, but which are entirely harmonious with the main idea and purposes as expressed in the title, it is not a violation of that portion of the constitution of the state of Georgia relating to the inclusion in an act of legislature of more than one subject-matter or to its containing matter different from that expressed in the title.

In the opening paragraphs of his decision Judge Candler takes occasion to refer to the phraseology of the indictment in terms which suggest that his criticisms may have been the outgrowth of unpleasant personal experience in connection with dental professional service. He says: "The accused was tried in the city court of Mount Vernon, upon an accusation charging that on the 17th day of July 1902, in the county of Montgomery, he did 'unlawfully and *with force and arms* engage in the practice of dentistry for fee, without registering in said county as required by law, and without legal authority from the Board of Dental Examiners of said state to practice dentistry, etc.' We will remark in passing that we have in the past had frequent occasion to doubt the propriety and appropriateness of the indiscriminate and almost universal use in indictments and accusations of the time-worn phrase 'with force and arms.' We cannot, for example, see the necessity of charging force and arms in indictments and accusations for perjury, vagrancy, and similar crimes involving the employment of no physical force. Suffering humanity, however, will attest the peculiar aptness of the phrase in cases like the present; and from this we should learn well the lesson that, amid the kaleidoscopic changes wrought by twentieth-century progress and advancement, it behooves us to be careful lest we slip too far from the moorings of our fathers, or desecrate with too ruthless a hand the ancient landmarks of the English law."

INFORMATION WANTED.—Any surviving graduates of the "Philadelphia College of Dental Surgery," which existed in Philadelphia from 1852 to 1856, are requested to communicate with W. L. J. GRIFFIN, D.D.S., 2009 North Twelfth street, Philadelphia, Pa.

INFORMATION WANTED.—DR. EDGAR O. KINSMAN, 15 Brattle Square, Cambridge, Massachusetts, desires to make inquiry through the pages of the DENTAL COSMOS as to the present address of Dr. John E. Whitmore, late of Paris, France, class of '77 of the Boston Dental College. We cheerfully publish this inquiry with the request that anyone having information on the subject will kindly communicate it to Dr. Kinsman.

BIBLIOGRAPHICAL.

DENTAL MATERIA MEDICA, THERAPEUTICS, AND PRESCRIPTION-WRITING. By ELI H. LONG, M.D., Professor of Dental Materia Medica and Therapeutics in the Dental Department of the University of Buffalo, etc. Philadelphia and New York: Lea Brothers & Co.

The author says in his preface that the book has been prepared "for the purpose of making the work of the dental student in this particular branch easier without restricting its scope." The work embraces 321 pages including the index, and the subject-matter is divided into nineteen chapters. The first twelve are devoted to the discussion of local remedies, the remainder being taken up with the consideration of general remedies. The book is by no means free from errors, some of which are excusable, inasmuch as the attainment of perfection in the preparation of books is a matter that can hardly be expected; others, however, are not so, as they denote on the part of the author a lack of the proper amount of care and attention which an editor must bestow in order to produce a work reasonably accurate. As examples of some of the errors referred to we must point to page 72, where we find chromic acid included in the group of organic acids, and to page 73, where the following statement appears: "In chemical nature this substance (carbolic acid) is not an acid, but an alcohol, the term 'acid' having been given on account of its corrosive action." This is not, as a fact, the true or scientific reason why phenol is classified as an acid. It is called an acid because it will combine with bases to form salts.

The author has omitted in dealing with each drug the description of the method of preparing or obtaining it; for instance, in speaking of iodoform the only reference to its preparation is the following: "Usually obtained in the form of a lemon-yellow powder, with a penetrating odor resembling that of iodine." This explanation is both incomplete and misleading; the word "usually" would imply that iodoform is not always obtained in the form of a yellow powder.

Our attention has also been directed to the insufficiency with which the author has treated the subject of mercury. He tells us that mercury is eliminated "chiefly by the bowels," and so far as we have been able to see omits all reference to its elimination through the oral mucous membrane—a condition which has a large share of influence in producing those pathological changes which ultimately convert the lining membrane of the mouth into a suitable area for the development and propagation of disease-producing bacteria.

The author devotes thirty-six pages to the discussion of anesthesia. This chapter has been carefully prepared, and, together with the table of poisons and antidotes on page 257 and the index of drugs on page 265, constitutes in our estimation the most important feature of the work.

The chapter on the bleaching of teeth, though not fully treated, is in harmony with our latest knowledge on the subject, as the author has quoted almost entirely from the standard dissertation on the subject in the "American Text-book of

Operative Dentistry." The author has incorporated in the text several well-prepared tables to illustrate the physiological effects of some of the most powerful agents, and this constitutes likewise a novel and valuable feature.

The inaccuracies to which we have called attention, and the omission of

such important factors as the derivation or preparation of drugs and the technique of their application in the treatment of diseases of the oral cavity, detract greatly from the usefulness of a work which would otherwise be well adapted for the purpose which it is intended to fulfill.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Oesterr.-Ungarische Vierteljahrsschrift für Zahnheilkunde*, Vienna, January 1903.]

AN IMPROVED AND SIMPLER METHOD OF TAKING IMPRESSIONS OF THE MOUTH. BY DR. E. LATZER AND DR. K. WEISL.

The purpose of the method devised by Drs. Latzer and Weisl is essentially to hold together by means of a piece of gauze the different pieces of a plaster impression fractured during its removal from the mouth. A tray of the proper size and shape is selected, and after it has been coated with vaselin its entire surface is covered with a layer of gauze previously soaked in water. The gauze is made to project two or three centimeters beyond the margin and over the sides of the tray. It is not essential that the material should rest smoothly against the surface of the tray, as the presence of folds does not at all interfere with the result. The plaster used in filling the tray should be at first of liquid consistence, so that when it is poured the gauze will be raised slightly. By this plan, when the tray is completely filled the gauze will be contained within the substance of the plaster. The author uses a weave of gauze known as "Mechlin," as it possesses the qualities necessary for this kind of work—namely, thinness combined with strength of fiber. After the tray has been introduced into the mouth it is allowed to remain *in situ* until the plaster has thoroughly hardened. It can then be removed without any difficulty on account of the coating of vaselin which was made before pouring the plaster. The impression is now removed by means of the middle fingers, introduced between the jaw and the cheek. The plaster will be fractured, of course, but it will not come out in too small

pieces; and further, not a single piece can be lost. It is claimed for this method that it facilitates the removal of the impression from the mouth without any crumbling of the plaster, and secures the accurate reconstruction of the impression, all the sections being held together by means of the gauze.

[*Deutsche Zahnärztliche Wochenschrift*, Berlin, February 21, 1903.]

GUTTA - PERCHA - CEMENT. BY EMIL HERBST, D.D.S.

In order to obtain in a single preparation the combined properties of gutta-percha and cement, Dr. Herbst has devised the following method: A given quantity of cement powder is mixed thoroughly with an equal amount of base-plate gutta-percha filings, and into the resulting mixture a small amount of cement liquid is incorporated. This paste becomes thoroughly hard and can be advantageously used in setting crowns and bridges. It becomes soft and malleable when heated, and therefore a bridge set with it can be easily removed.

Incidentally he refers to another method of obtaining a gutta-percha-cement compound, which consists in mixing together equal quantities of cement paste and gutta-percha solution. This combination makes a preparation which easily adheres to the walls of the tooth and becomes slightly soft upon being heated.

Dr. Herbst offers these methods as mere suggestions on the possibilities of mixing cement with gutta-percha with the object of obtaining a material possessing the advantages of both, and he says that the results obtained in the few cases in which he has tried the combination would warrant its further trial by the profession.

[*Journal of the Medico-Chirurgical College, Philadelphia, 1903.*]

THE RELATION OF TIC DOULOUREUX TO DENTISTRY. BY F. SAVERY PIERCE, M.D., PROFESSOR OF NERVOUS AND MENTAL DISEASES, MEDICO-CHIRURGICAL COLLEGE, PHILADELPHIA.

It is stated that the teeth and the oral cavity bear to tic douloureux the same important relation that the exciting cause does to any general or local affection. There are cases, of course, in which the teeth are not the cause and there is no etiological factor resident in the mouth to account for this serious and painful neuralgic affection. But in fifty per cent. of the cases of tic douloureux there is a very close connection between it and abnormal conditions, such as overcrowding, or more often of pathological processes, such as pyorrhea and infected pulps. Neuritis of the inferior and superior dental nerves is set up, becoming chronic and finally ending in an insidious ascending neuritis throughout the branches of the fifth nerve on the affected side. A low grade of inflammation thus becomes established as the cause of the terrible malady.

The author says that this short contribution to the subject is written with the hope that it may stimulate physicians and dentists to grasp more seriously the remote effects of septic disease of any extent or grade within the mouth, so that prophylaxis may be better effected by promptly treating apparently innocent tartar-covered teeth. It is further stated that one source of aggravation of painful tic is that which consists in the traction exerted upon the pulp in the case of teeth that may be perfectly normal but whose masticating surfaces are unopposed owing to the loss of corresponding teeth in the opposite jaw. Such a case came under the author's care and was successfully treated by the extraction of several teeth which had not antagonists.

[*International Journal of Surgery, New York, February 1903.*]

SHOCK AND ITS TREATMENT. BY GEORGE CHAFFEE, M.D., BROOKLYN, SURGEON TO THE LONG ISLAND RAILROAD.

Shock, the author says, may range from that following a slight injury to that of profound shock bordering on collapse. Shock may be physical or mental—from sudden or unpleasant news or fear of approaching danger, from traumatism, from hemorrhage, from anesthesia, and even from bloodless operations. The author believes that the first effect of

shock is upon the nerve centers and that then the heart's action and the general circulation are interfered with. The peritoneal cavity cannot be opened without shock to the patient. The temperature of the operating room and the extent of traumatism inflicted by the operator play a very important part. The highly endowed nervous organism, whether acquired or hereditary, constitutes a predisposition to shock.

Mild cases of shock may often be treated by recumbency, warm drinks, heat applied to the feet, or perhaps a small bottle of warm water held in the hands. The latter he has found to be very useful and it has given much comfort in cases of mental shock. Where the degree of shock is not great, a small cup of hot black coffee, bouillon, or clam broth is of great service, but in cases of profound shock, from whatever cause, it is useless to undertake any form of medication through the stomach, for there is very little, if any, action of that organ for some time after such shock, and if agents be forced into it the expected results are not obtained. Strychnin may be safely repeated in doses of one-sixtieth to one-thirtieth of a grain hypodermically every half-hour for from two to four hours. As in the milder cases, the hot-water bottle, to the hands and feet, over the head, and at the pit of the stomach, is of great service. Shock due to anemia should be treated by position, lowering of the head and elevation of the extremities, with heat applied to the latter. Here, again, the use of strychnin is indicated, as being a great heart stimulant, and strophanthus, the great heart tonic. Both are safe and reliable, and with the latter we can hold what we have gained by the proper use of the former. Strychnin is the lash applied to the horse, while strophanthus is the block placed under the wheel to hold what we have gained by the use of the whip. Morphin is not indicated unless some pain is present, but if given at all the dose should be very small.

[*La Odontología, Madrid, December 1902.*]

A NEW METHOD OF DEVITALIZING PULPS. BY J. D. LOSADA, D.D.S.

The method suggested by Dr. Losada consists in first anesthetizing the pulp with cocaine introduced into the parenchyma of the organ by means of pressure followed by an application of arsenic, likewise introduced by means of pressure. The object of this procedure, the author tells us, is to prevent the painful effects known to follow arsenical applications. He discusses the physiological ac-

tion of arsenic upon the pulp, and states in this connection facts too well known to call for repetition in this review. He says that when the pulp is in a violently hyperemic state the dilated vessels do not rapidly absorb the arsenic, and that in cases of this kind it becomes necessary to make an immediate extirpation of the pulp by means of anesthesia and pressure, as the method used at present to relieve inflammatory conditions of pulps is not only difficult but doubtful. If the pulp is in a severely inflamed condition, the use of arsenic, as stated by the author, is contra-indicated, for the reason that instead of devitalizing the organ it will only increase the congestion, and therefore the pain incident thereto; but he fails to remember that if the pulp of a tooth is the seat of such congestive phenomena it will fail to absorb readily not only arsenic, but, for that matter, any other medicament, especially cocain hydrochlorid—which, as has been pointed out frequently, seldom acts in an inflamed area. Consequently we do not see the possible application of Dr. Losada's method in cases in which it becomes necessary to devitalize congested pulps. If arsenic is not absorbed by the pulp because of its inflamed condition, it is probable that neither will cocain be absorbed.

Regarding the pharmaco-dynamics of arsenic, he advances several statements which are not in exact accord with our present knowledge of the action of arsenic upon animal tissues. In cases in which it is advisable to extirpate the inflamed pulp, the first step should consist in relieving the inflammatory condition and the engorgement by making the pulp bleed. This procedure is neither difficult nor doubtful, and once the congestion is relieved, the matter of applying the arsenic becomes very much simplified, as the only barrier to its action has been removed.

[*Dental Register*, Ann Arbor, February 1903.]

OBTUNDING SENSITIVE DENTIN WITH CATAPHORESIS. BY WESTON A. PRICE, D.D.S.

Dr. Price reports an interesting case of hypersensitive dentin successfully obtunded by means of cataphoresis. The tooth in which it was applied was considered an ideal case, as it was so sensitive that the patient would not even tolerate the slightest effort to separate it from its neighbors. The anesthetic used was a saturated solution of cocain hydrochlorid, which was placed in the cavity on a small coil of platinum wire which served as the electrode. The appliance used for producing the cataphoresis was an apparatus composed

of three distinct instruments combined in such a manner as to make it possible to have absolute control of the amount of current used. The apparatus consists of a battery of thirty dry cells so connected to the cell-selector that any number of cells can be called into use as needed. The second part is a new controller which is a complete departure from any now in use. It permits application of the current so gradually that it is not possible to produce pain. The third element of the apparatus is a millimeter which has a scale which can be read in hundred-thousandths of ampères at a distance of thirty feet.

[*l'Odontologie*, Paris, January 30, 1903.]

A CASE OF SUPERNUMERARY TEETH. BY M. LAURENT, PARIS.

The case reported by Dr. Laurent at the Société d'Odontologie was that of a man, aged twenty-seven, who presented upon the mandible three supernumerary teeth, two upon the right side, one being situated internally to the arch; the remaining one upon the left side was also located on the inner side of the arch. One of the teeth on the right side is a fairly good specimen of a bicuspid tooth.

[*Journal of the British Dental Association*, London, February 1903.]

CASES OF FITTING NEW PORCELAIN FACES TO BROKEN CROWNS AND AN INCISOR CROWN FITTED TO A PIN IN THE ROOT-CANAL OF AN ADJOINING TOOTH. BY CARL SCHELLING, L.D.S., LONDON, ENGLAND.

The author describes the following method of replacing broken porcelain facings: He selects a thin porcelain face, backs it with gold, rivets the pins into countersunk cavities, fits the facing to the root and gum, narrows and shortens the backing of the old crown, and fits a piece of gold to the lingual side of the old gold and joins this to the backing of the new facing with hard wax, removes it, and solders it all around. In order not to disturb the bite, he grinds away a portion of the lingual gold of the crown and slides the new facing over the old back and cements it into position.

He also describes a case of a right incisor which was replaced by the following procedure: The left central incisor, which was abscessed, had a large mesial cavity filled with cement. He removed the filling, and after treating the root-canal, opened it widely from behind, fitting into it a square iridio-platinum pin bent at right angles. A piece of pure gold was fitted to the pin so as to cover the orifice

of the cavity, and a suitable flat porcelain tooth was backed and soldered to the horizontal portion of the bar, leaving a small extension of the backing to touch the corner of the adjacent lateral incisor in order to prevent rotation.

[*l'Odontologie*, Paris, January 30, 1903.]

PROSTHESIS OF THE SKELETON: OSSEOUS SUBSTITUTES MADE OF HIGH-FUSING PORCELAIN. BY PROF. LÉON DELAIR, PARIS.

After referring to the disadvantages of hard vulcanized rubber as a material from which to make substitutes for lost parts of the skeleton, the author states that with the high-fusing variety of porcelain which he has finally adopted he obtains very satisfactory results. As compared with hard vulcanized rubber it has the advantages that it can be kept thoroughly clean and that it is easier of manipulation. The author intends to show in a future communication that osseous substitutes made of high-fusing porcelain are sufficiently resistant to carry out the function of the lost parts.

[*Journal of the British Dental Association*, February 1903.]

ABNORMAL FORMATIONS OF BLOOD-VESSELS IN THE HARD DENTAL TISSUES. BY DR. PEREZ HIRSCH.

The author refers to the investigations upon the distribution of vessels in the teeth carried on by Lepkowski ("Die Verteilung der Gefäße in den Zähnen des Menschen") and to a case observed by Thiel, in which, after the extraction of an upper right first bicuspid, severe bleeding set in. This, after careful examination, was found to have originated in a bundle of vessels on the lateral wall of the alveolus which penetrated the tooth at its neck, and went straight through the dentin into the pulp. In view of the extreme rarity of similar cases, the author describes one which came under his observation in November 1902. The patient, a man aged forty-two, came under his treatment on account of acute pain in a lower left first bicuspid. It is noteworthy that according to the patient he always had the impression that the pain started in a very small hole in the tooth, much below the gum, between the diseased tooth and the canine next to it. At the desire of the patient the tooth was extracted, and its examination gave the following result: On the mesial surface of the tooth, at a level equal to exactly half the distance between the highest point of the masticating surface and the

apex, and twice as far from the lingual surface as from the buccal surface, there was a nearly round, sharply marked opening, the vertical longitudinal diameter of which measured one millimeter, while the transverse diameter measured three-quarters of a millimeter. This opening formed the external orifice of a channel of the same width, which running vertically to the longitudinal axis of the tooth, crossed the same in a mesio-distal direction with very slight curvature upward; the lingual side crossed cementum and dentin and opened into the pulp cavity.

The author says that in the present case he had no doubt that the canal was a vascular one, and that it is especially interesting because of the complete communication between pulp and pericementum.

[*l'Odontologie*, Paris, February 15, 1903.]

CLINICAL LECTURE ON ANESTHESIA.

BY DR. FRITEAU, PROFESSOR AT THE ÉCOLE DENTAIRE OF PARIS.

Dr. Friteau called attention to the precautions to be observed, especially by the dental surgeon, in connection with the administration of general anesthetics, such as chloroform or ether. He advises the dentist to consult the patient's physician as to the advisability of using a general anesthetic and to decide upon its administration only after the physician's consent. The dentist should see to it that the mouth is put in as aseptic a condition as is reasonably possible. All deposits should be removed and the patient should be instructed to use the following mouth-wash:

R—Chloral hydrate,	5 gm.
Saturated chloroform water,	250 "
Boiled water	250 "
	M.

Sig.—Use as a mouth-wash every day for four or five days previous to the date set for the anesthesia.

Or,

R—Neutral hydrogen dioxid,	250 gm.
Boiled water,	250 "
	M.

Sig.—(Same as the previous formula.)

Or,

R—Carbolic acid crystals,	5 gm.
Glycerin,	50 "
Oil of peppermint,	5 drops.
Boiled water,	500 gm.
	M.

Sig.—To be used as a mouth-wash.

Before beginning the anesthesia the dentist himself should irrigate the patient's mouth and pharynx with one of these solutions. This procedure he considers very important, in

view of the fact that whenever the dentist has to resort to a general anesthetic a considerable number of extractions have to be performed and the wounds and lacerations resulting from the operation will heal more rapidly if the mucous membrane is in a healthy condition. The author referred to the preparation of the operator, of the instruments to be employed, and of the operating room, the temperature of which should be at least 70° F. He recommends the administration to the patient of forty grams of magnesium citrate the day previous to the operation.

He then called attention to the post-operative care of the patient, stating among other things that rapid healing of the alveolar tissue can be brought about by irrigation with the chloral solution already given.

[*Dental Register and Dental Summary*, February 1903.]

THE PREDISPOSING FACTOR IN DENTAL CARIES. BY EDWARD C. KIRK, D.D.S., SC.D., PHILADELPHIA.

The author, referring to the problem of the etiology of dental caries, states that the belief that the cause was wholly or in part internal to the tooth has been in evidence since the writings of Celsus, in the first century, up to 1897, when Dr. J. Leon Williams, in a paper read before the New York Odontological Society, destroyed the last remnant of any foundation in support of the doctrine of an internal factor in the causation of caries. Dr. Kirk calls attention to the investigations of Black on the relation of dental caries to the physical characters of the hard structures of the teeth, and says that whatever may have been the difference of opinion expressed upon minor points, the major conclusion, that the exciting cause of caries is a factor of dental environment, must be generally accepted.

The author has carried out important investigations in order to elucidate the problem of *why* teeth decay. There are certain well-known facts, the result of general clinical observation, which our present knowledge of the cause of dental caries fails to explain—namely, the immunity of certain dentures from carious action and the extreme susceptibility of others to decay; second, the periodic oscillations in the conditions of susceptibility and immunity that have been observed in the same individual; and third, the tendency to physiological oscillation in immunity from tooth-decay noticeable in very many individuals in passing from youth to old age.

As the result of special etiological research it is known that caries of the teeth is due in

the first instance to the action of certain groups of micro-organisms that cause acid fermentations, ending mainly in the production of lactic acid, the decalcifying agent; second, that the lactic acid bacteria thrive best, and indeed almost exclusively, in a carbohydrate medium; third, that, given a dental environment presenting a pabulum suited to their development, caries is certain to follow; and, as Dr. Kirk says, we can conceive of but two methods by which the carious process could be inhibited or prevented. First, by the withdrawal or elimination of one or more of the factors essential to the carious process; or, second, by the introduction into the environment of some substance or condition which would seriously interfere with the functional activities of the bacteria concerned in the carious process.

As to the prophylactic treatment, the author reminds us that the various procedures that we may employ in prophylaxis are defective from the fact that their action is temporary, because they are applied intermittently and they are effective only in proportion to the persistence with which they are employed, while the persistence of bacterial influence, other things being equal, is a continued factor.

The author then takes up the question of the conditions which produce susceptibility and immunity to dental caries, and in this connection says that very little is known on these two problems, but that the periodic oscillations in susceptibility and the tendency of some as compared with the immunity of other individuals to dental caries points strongly, if not inevitably, to the conclusion that dental caries is a diathetic condition. That it is closely related to the processes of bodily nutrition there can be no doubt, for upon no other grounds is it possible to explain the variations in the rapidity and intensity of carious action in relation to variations in the health status of the individual so generally and frequently observed. The only two hypotheses upon which immunity from caries can be logically explained are, first, the elimination from the tooth-environment of some factor essential to the carious process; and second, the introduction of some element inimical to the functional activities of caries-producing organisms.

Dr. Kirk then refers to his investigations of the composition of mixed saliva in its bearing on the production of dental caries, saying that in all cases where true caries was prevalent, and especially in the case of children, he found the presence in the saliva of a dissolved carbohydrate which responded to Von Jaksch's

iodo-potassium iodid test for glycogen and erythro-dextrin.

The presence of glycogen in the saliva is highly probable, though in the absence of more characteristic tests its presence cannot be taken as finally demonstrated. The author discusses the significance of the presence of that compound in the saliva, and says that the predisposition to dental caries is correlated with, and dependent upon, a diathetic state, making it appear as not at all unlikely that in cases of marked susceptibility to dental caries some fermentable carbohydrate substance, such as glycogen, the product of food metabolism is constantly dialyzed from the blood into the mouth through the medium of the glandular apparatus of the buccal cavity.

The next topic that the author discusses is that of the reaction of the saliva as a predisposing factor of dental caries. His tests of saliva in pronounced cases have shown a constant alkaline or neutral reaction, and where the reaction of the secretion is acid he has observed a tendency to inhibition of the carious process with the development of erosion. He also calls attention to the fact that these reactions are not the result of fermentation of the secretion in the mouth, but are characteristic of the secretion as it is poured into the mouth, and that if the reaction of the saliva has any modifying effect upon its suitability as a culture medium for the development of caries-producing fungi, we have in this case additional evidence that the predisposition to dental caries is a factor of general nutrition—a diathetic condition dependent upon the processes of metabolism of food—for the reaction of the saliva depends upon that process.

He then calls attention to the experiments he has conducted which demonstrate that all cavities found in teeth are not due to the action of caries, but that some are due to the action of sodium acid phosphate upon the tooth-structure with little or no lactic acid action.

The cases in which the rapid dissolution of tooth-substance is due to the action of this sodium acid phosphate are, strictly speaking, cases of erosion. The existence of sodium acid phosphate in the saliva is attributed by the author to insufficient oxidation of the carbohydrate food taken into the body, leading to an over-production of carbon dioxid as compared with the assimilation of oxygen. The surplus of carbon dioxid, acting upon the neutral sodium phosphates through the action of the buccal mucous glands, converts these compounds into sodium acid phosphate, which, when exuded through the buccal mucous

glands, causes a destructive action upon the teeth.

The author then refers to the part which natural selection may play in the predisposition to dental caries, and says that the composition of the culture medium acts passively through natural selection as a powerful agency in determining the character of bacterial infection and growth, and that applying this principle to the problem of predisposition to dental caries, it becomes obvious that as the composition of the saliva is known to vary in relation to nutritional states, the conclusion is reached that the predisposing factor in dental caries is diathetic, and that true prophylaxis can only be achieved by a profound study of nutrition and of the modifications in the nutritional process which would alter the character of the oral fluids so as to make them unsuitable for the production of caries-producing fungi.

[*Trans. Odontological Society of Gt. Britain, London, January 1903.*]

SOME POINTS IN THE MECHANICS OF THE JAWS. BY J. ARBUTHNOT LANE, M.S., F.R.C.S.

The development of the bones of the face depends on the influence exercised by the passage of air through the naso-pharynx, by the tongue, and by the teeth, both in occupying space and in transmitting pressure. A far-reaching responsibility rests on the members of the dental profession in that they should formulate methodically the mode of formation of the several deformities, and also the precautionary means by careful attention to which it is possible to obviate their appearance altogether. This cannot be done completely by a study of the mouth alone, but this must be supplemented by a thorough knowledge of the medical history of the patients. The author gives as an instance the various deformities of the jaws and teeth which are associated with imperfect performance of the function of the naso-pharynx, and says that these are all treated by the dental surgeon necessarily very imperfectly, for the reason that no serious attempt is made to destroy the factors determining their development during the time when such attempts are capable of exerting some restraining influence, but he is satisfied to try to correct the irregularity of the teeth or dental arches alone by mechanical means.

The author showed a case of an upper jaw of an infant born with no anterior nares, showing the high palate as it existed at a very early age—indeed, at birth. This case illus-

trates a general law, namely, "The height of the palate varies inversely as the development of the naso-pharynx." He then showed the case of a maxilla of a child of three years, showing the commencement of the formation of high palate in consequence of an acquired imperfect development of the naso-pharynx from respiratory incapacity and local infection. Again, the abnormally small mandible which is so frequently present, especially in females, in cases of imperfectly developed maxillæ, constituting the common variety of deformity called superior protrusion, could have been avoided by the normal development of the tongue, and could have been influenced advantageously in early life by such exercise of that organ as would have been afforded by suitable food and by the use of chewing gum, etc. A case came under the observation of the essayist which illustrates the mechanical influence the tongue itself exerts upon the size of the mandible. The patient, a boy of eight years, was suffering from a gummatous affection of the tongue which had produced considerable increase in its size. This enlargement had existed for a little more than three years. The organ varied in size with treatment during this period, but never regained its original bulk, being always very definitely larger than normally. Before the trouble arose in the tongue the jaws were apparently normal, but not long after the appearance of the enlargement the boy was noticed to keep his mouth open, and to breathe through his nose, and later to have lost all power of biting with the front teeth.

The author then describes the conditions brought about by the enlargement of the tongue, especially through over-development of the mandible and the disturbance of the articulation brought about thereby. The author says that he has seen on previous occasions almost precisely the same condition of the mouth resulting, at an earlier period of life, from the enlargement of the tongue by gum-mata.

He then calls attention to the less common variety of superior protrusion in which the development is brought about, not by imperfect development of the maxilla, but by an imperfect or atrophied condition of the tongue and mandible, saying that cases of this nature illustrate plainly the importance of the tongue as a factor in determining the development of the mandible.

To illustrate the comparatively serious nature of operative interference the condition of facial deformity may demand, the author describes briefly the details of a case of open

bite associated with all the conditions of the maxilla which resulted from imperfect development of the naso-pharynx and with the enlargement of the mandible consequent on the excessive development of the muscles of the tongue, producing the overhanging mandible and the open bite. The boy was unable to bite his food. His mouth was always open, and his lips were consequently thick and everted. His general appearance was anything but pleasing, while his breath was offensive, and his teeth and gums were covered with decomposed foodstuffs, etc. The state of his health was correspondingly unsatisfactory. Incidentally the author calls attention to the amount of decomposition and inflammation that go on in the gums and about the teeth in cases of open bite. When the child was young, the teeth were perfectly normal, these disturbances having appeared later in life. His tongue was larger than normal.

In order to remedy the deformity, and to reduce his masticatory, respiratory, and esthetic disability to a minimum, careful measurements of plaster casts were made, and experimental sections were made through them to determine how much bone should be removed in order to obtain the most benefit. After this was accomplished, a triangular area from the body of the lower jaw on each side was removed, the fragments were fastened securely together with stout silver wire in such a position that the front teeth fitted on those of the upper jaws as closely as possible. In order to accomplish this it was necessary to bring the anterior fragment upward into a place much above that which it had originally occupied to meet the receding upper incisors.

The teeth in the anterior segment of the lower jaw were not influenced by the section of their nerves and bloodvessels. The author adds further that in a case in which the mandible had been divided on either side in order to improve either the biting capacity or the appearance of the patient, the teeth in the anterior segment apparently suffered no injury, and in the case here cited the condition of the teeth, as that of the mouth and the general health of the individual, were greatly improved by the absence of the offensive, decomposing, pasty material covering the teeth and which had resulted from the functional inactivity of certain teeth and from the excessive ventilation of the mouth consequent upon the high degree of open bite.

Curiously enough, the tongue has altered in form owing to the wasting of its anterior portion resulting from the diminution in the size of the bony space it occupies.

PERISCOPE.

Cleaning Impression Trays.—To remove all wax from impression trays, boil in water into which has been placed a small amount of common washing soda.—J. R. WATT, *Dental Review*.

Formaldehyd.—A dram or two of formaldehyd solution will deodorize a spittoon for days. A ten per cent. solution disinfects instruments in ten to twenty minutes.—*Dominion Dental Journal*.

Action of Disinfectants.—A disinfectant is an agent that will destroy the infectious power of infectious material in the smallest quantity without change to the tissues.—A. W. HARLAN, *Dental Review*.

The Most Powerful Germicide.—The best germicide is the flame; this is acknowledged. If the point of an instrument is so small that the heat will ruin it, dip it in alcohol, and as soon as it is burned off all bacteria will be killed.—*Western Dental Journal*.

Erasing Powder.—Alum, sulfur, powdered pumice, potassium nitrate, equal parts. Powder, mix together, and preserve in a bottle. A little of this powder sprinkled on a blot or over recent writing, and then rubbed with a clean piece of rag, will entirely obliterate the marks.—*Western Druggist*.

Plates Versus Bridges.—Fifty per cent. of the people who are wearing bridges, or trying to wear them, would have been much better served as to appearance, comfort, and usefulness had the dentist who inserted them had the skill to properly adjust a gold plate.—E. C. FRENCH, *Dental Review*.

To Remove the Odor of Iodoform from the Hands.—The odor of iodoform may be removed from the hands by washing with a weak solution of tannic acid, by rubbing freely with chloroform, by bathing them in vinegar, or by ablutions in flaxseed-meal water.—*Journ. of Medicine and Science*.

Behavior of Disease Germs in Moist Atmosphere.—Disease germs more readily float in dry air than in an atmosphere charged with moisture. In preparing a room for an operation the use of steam will tend to purify the air by causing germs to fall to the floor, which it is advisable to moisten or to cover with damp sheets.—*Internat. Journ. of Surgery*.

To Clean Rubber-Dam Clamps.—To clean rubber-dam clamps, place a number of them in the palm of the hand, add a little powdered pumice, moisten with water, and work together for a few minutes; then rinse in clear water and you will find that all the little crevices so hard to get at will be polished.—F. W. STEPHAN, *Dental Review*.

Pyorrhea Alveolaris and Atrophy of Alveolar Tissues.—Pyorrhea alveolaris is sometimes confounded with a number of other diseases of the gum, as well as with atrophy of the alveolar portion of the jaws. The latter not only occurs in aged patients, but is sometimes met with quite early in life.—C. F. W. BÖDECKER, *Dental Review*.

Etiology of Malformation.—One cannot make a critical study of the deviation of the nasal septum and malocclusion of the teeth without being struck by the remarkable parallelism of the two conditions. Both appear at the same age, they are frequently found in the same patient and have much in common etiologically.—*Items of Interest*.

Primary syphilis of the fingers and hands, for obvious reasons, occurs more frequently in physicians than in any other class of people. Hence no physician is justified in failing to disinfect his hands with the utmost care after every examination of mucous membranes. The worst way of diagnosing syphilis is by a culture experiment on the doctor himself.—*Internat. Journ. of Surgery*.

Anesthesia of Mucous Membrane.—Insensibility of the mucous membrane may be easily produced by the external application of a beta-eucain solution. The injection of a one per cent. solution (to which six-tenths of one per cent. of sodium chlorid have been added) at body temperature is absolutely painless, and effects a thorough anesthesia lasting twenty-five to thirty minutes.—*Items of Interest*.

Porcelain Crowns.—The more common method of making a porcelain crown is to select a facing of suitable color and attach it to the base by soldering or clinching the pins to the dowel, and then adding the porcelain backing. I find it almost as easy, however, to carve and bake the entire crown, and one saves thereby the selection of the facing, grinding of the same, and the soldering of the pins.—WM. A. STRING, *Dental Review*.

Arsenic in Potassium Carbonate.—C. E. Carlson (*Phar. Centralhalle*, 1902, p. 617) reports that some crude potassium carbonate that he examined contained appreciable quantities of arsenic. The salt was of German origin, and was supposedly obtained from the wool washeries. In view of the extensive use of potassium carbonate by bakers and others the possible dangers are self-apparent.—M. L. WILBERT, *Amer. Journ. of Pharmacy*.

Filling of Children's Teeth with Gold.—I desire at the outset to make the statement that the one invariable feature of my practice during the past twenty-five years has been this rule, that children's permanent teeth should be filled with gold whenever it could be properly done. Furthermore, that at no time have I recognized that a difference in the structure of the teeth would demand a departure from the rule.—R. OTTOLENGUI, *Dominion Dental Journal*.

Use of Cotton Rolls with Clamps.—The use of cotton rolls with clamps is of great advantage in setting crowns and in places where it is impossible or inadvisable to apply the rubber dam, and is applicable to the upper teeth as well as the lower. Where it is necessary to keep the work dry for a considerable time the use of non-absorbent rolls with the clamp, backed up by absorbent rolls that can be changed, or by the saliva ejector, will be of advantage.—*Dental Brief*.

Fatalities with Nitrous Oxid in Patients with Affected Throat or Tonsils.—In deaths from "laughing gas" a very considerable proportion of them have been in cases in which the throat and tonsils have been affected. The congestion caused by the gas seems to increase the swelling, and death in many of the cases has been found by post-mortem examination to be due to edema of the glottis.—RALPH HOPTON, *Journ. Brit. Dental Association*.

Evacuation of Pus.—It is a rule, to which there are practically no exceptions, that if you feel fluctuation from pus anywhere there is no reason for waiting and poulticing before evacuation. It only makes the abscess larger, infects more tissue, and prolongs the disease. If the diagnosis be uncertain, have recourse to the aspirating needle.—*Internat. Journ. of Surgery*.

[The presence of pus in the oral tissues is a condition so easily diagnosed that the use of the aspirating needle, so valuable in general surgery, finds scarcely any application in dentistry.—Ed.]

Antiseptic Hemostatic.—The German pharmaceutical journals publish the description of a patent granted to R. Rhode, of Breslau, for a preparation containing 50 gm. of powdered alum, 10 gm. of borax, 10 gm. of glycerin, 5 gm. of zinc oxid, and 10 gm. of formaldehyd solution. These ingredients are melted together and poured into suitable molds. The combination, it is said, gives an efficient hemostatic that is at the same time antiseptic and promotes healing.

Extraction in Orthodontia.—There is an idea among a few members of our profession, some of them college professors, that it is wrong to extract teeth in regulating. I think such teaching is wrong. There are cases where extraction would be right and cases where it would be wrong. The aim should be to consider, first, facial comeliness. The objects of the correction of irregularities are—first, to improve personal appearance; second, to improve mastication; third, to improve speech.—*Dental Office and Laboratory*.

Teeth Decayed Beyond Bifurcation.—Teeth decayed beyond the bifurcation will often prove useful and permanent tenants. The canals are treated and filled. The exposed soft tissue may be properly dressed, then over it and in contact with it place a layer of tin foil or of platinum. A floor of amalgam is worked over this, to be supported by the walls and ends of the roots. The filling is finished as desired, being retained by posts from the canals or undercuts in the walls or root-ends.—JOHN E. WILKINSON, *Dominion Dental Journal*.

Necessity of Using Matrices in Filling Approximal Cavities in Molars and Bicuspids.—It hardly seems possible that anyone would attempt to put in a mesio- or disto-occlusal amalgam filling without using a matrix of some sort, and yet I cannot account for some work on any other theory. I have recently seen some in which more amalgam was packed into the interproximal space than was used in the filling. As for the kind of matrix to be employed, that depends upon the taste and fancy of the operator. The main requirements are that the material should be thin and capable of being fitted and held to the gingival border. Thin steel sheets, nickel or tin strips, cut for each case, seem to answer the purpose and possess advantages over fixed matrices in some particulars; they can be bent or cut to suit, and are more easily detached, with less danger to the filling.—H. G. LOGAN, *Dental Review*.

Cohesive and Non-Cohesive Versus "Soft" and "Hard."—I do not like the term "soft" and "hard" as often used. It is much better to retain the terms cohesive and non-cohesive. I use cohesive and non-cohesive gold in combination to good advantage by placing a layer of non-cohesive gold on the cavity margins and covering it with a layer of cohesive foil. By placing it in alternate layers a hard filling will be made and at the same time the adaptation to the cavity walls is made more perfect.—J. F. STEPHAN, *Dental Summary*.

Making Drills from Old Burs.—A useful instrument, easily formed and sharpened, may be made from worn-out burs of various shapes and sizes by the use of emery or finer lathe stones. Flatten the two or four sides, as the case may be, forming a drill, not pointed, but shaped more nearly to a chisel edge. Finish the sharpening on a fine Arkansas or other stone. The best kind of a drill of this class is made from an old cross-cut fissure bur, ground on the two opposite sides only, leaving the natural serrations on the edges.—H. G. LOGAN, *Dental Review*.

Should We Devitalize the Pulps of Teeth to be Crowned?—As crown and bridge work is being more and more practiced, this question seems to me to be one in which the conservation of the teeth should be most earnestly considered. My own antipathy to the ruthless destruction of the pulp in strong healthy teeth is so great that I cannot view with any degree of acquiescence the theory or practice of devitalizing such teeth merely to make piers, and I fail to be convinced that a sound tooth, even under crowning, must necessarily die.—J. G. PALMER, *Internat. Dental Journal*.

A Method of Articulating Plain Teeth.—I begin by setting the uppers as I want them, care being taken to have the bicuspid and molars conform to the lower ridge as much as possible (that is, laterally). Then I set the lower bicuspid in its proper place, which is between the upper first and second bicuspid. Then set the first bicuspid and molars to articulate properly. Follow the same rule on the other side. Then set the six lower anterior teeth. Generally they will be too wide to fit the space, and will have to be ground on each side a trifle to make them fit. I believe that mal-articulation is the cause of most misfits in lower plates, and if this rule is observed, one need never fail to have a perfect articulation.—H. M. CANNON, *Western Dental Journal*.

Alcohol to Arrest the Action of Carbolic Acid.—Of all the agents hitherto employed to limit the destructive effects of carbolic acid, alcohol when promptly applied is the most effective. This superiority is due to the rapidity and completeness with which the acid is taken into solution by alcohol, as well as to the lessened escharotic effect of the acid when thus combined. Hence, whenever the contact of carbolic acid with the lips or face of the patient is perceived or even suspected, alcohol should be promptly and freely applied to the part until the acid is as far as possible washed away.—*Dental Office and Laboratory*.

Replacing a Facing.—Grind the facing to fit the backing without removing the bridge or crown from the mouth. Drill holes in the backing to admit the pins, making them as nearly as possible opposite to and of the same diameter as the pins. After the facing has been ground to fit accurately it can be cemented in place and the pins riveted with a plate punch. A piece of wood, properly shaped, should be used on the labial or buccal surface of the facing to protect it, and with the flat jaw of the punch placed against the wood the pins of the facing can be securely riveted with the pin point.—E. S. WINGREN, *Dental Review*.

The Pulps in Teeth to be Used as Abutments for Bridges.—In crown and bridge work the question of whether sound teeth or teeth with only small cavities should be devitalized or not, when intended to be used as piers, has been frequently discussed of late. The radical says that he does not hesitate under any and all circumstances to devitalize. He claims that the tooth will be much more satisfactory. He states that the pulp will die in the tooth any way after crowning, and that he is only anticipating and thereby saving trouble to all concerned. Perhaps he believes that "dead men tell no tales."—J. G. PALMER, *Internat. Dental Journal*.

Color of Each Tooth.—As a general rule the upper centrals and laterals are nearly or quite the same color, the upper canines are yellower, and the remaining teeth a compromise between the two, and possibly darker. The lower teeth are nearly or about the same color, which is of rather a lighter shade than the upper canines. Color, we know, depends greatly on light, its direction, intensity, etc. It also depends on the translucency of the object under consideration. Two teeth may have exactly the same amount of coloring with the light from all directions, but they will differ markedly when placed in front of some dark object.—ALEX. JAMESON, *Dental Review*.

Camphor an Antidote for Morphin.—Hofmann (*Phar. Post*) finds that the action of camphor upon the heart is the opposite of that of morphin, having a sedative effect combined with an increased blood pressure, while morphin stimulates the heart's action and reduces the blood pressure. He further finds that injections of camphor reduce the dilatation of the heart, from which patients addicted to the use of morphin suffer when deprived of the drug. He has found injections of camphor solutions highly beneficial in the treatment of morphinism, at the first rendering it possible to greatly reduce, and finally, in a very few days, to entirely discontinue the daily dose of morphin.—*Western Druggist*.

Fallacy of the Term "Blind Abscess."—The dental world hears much of "blind abscesses." What is meant by this it is difficult to determine, as there is no such pathological condition existing. If by it is meant that an abscess may possibly exist somewhere without an outlet, a fistula, such an abscess may have a place in general pathology but not in dental practice. A deep-seated abscess requiring surgical attention might be so classified. An abscess means the formation of pus, and the tendency and function of pus, if it have a function, is to find an exit in the direction of least resistance. The term "blind abscess" should have no place in dental nomenclature.—*Editor Internat. Dental Journal*.

The Crawford Bicuspid Crown.—A useful bicuspid crown—less conspicuous than the all-gold shell or the porcelain-faced bicuspid crown—may be made, in cases where the root when trimmed down presents an unbroken horizontal surface, as follows: Make a Richmond cap consisting of post or posts, band, and top, soldered by not less than 20-k. solder. Place finished cap on root, select and grind to occlusion a suitable plain bicuspid tooth, and stick to place with hard wax. Remove cap and tooth in this position and trim away superfluous wax. Cut a pattern from paper or tin foil for a band, which will surround the tooth and unite with the cap. Cut band low buccally but high enough lingually to inclose lingual cusps. Unite this band with 20-k. solder; remove wax from cap, place band in position, invest and unite to cap with 18-k. solder, flushing it out buccally. Try on the root, remove, set the tooth in cap with cement, and afterward set finished crown. This crown was described some little time ago in the DENTAL COSMOS and was termed the J. Y. Crawford crown. I have used it with a great degree of satisfaction.—H. G. LOGAN, *Dental Review*.

Cement "Facings."—An occasional patient comes with a broken facing on a crown or bridge; it is necessary that it be immediately restored. The projecting platinum pins make a most excellent anchorage for a pellet of cement, properly colored, contoured, and polished with cuttlefish disks, thus restoring the missing facing in correlation with its neighbors until a more opportune time for a permanent operation. I have in my practice cement facings that have been in constant use for over a year, the patient well satisfied, and refusing for the time to have a more permanent operation. The coloring material, so far as I can determine, is as permanent as the filling.—WM. W. BELCHER, *Dental Office and Laboratory*.

Method of Preparing Facings for Posterior Bridges.—I have here a method of preparing facings that perhaps some of you have seen. I prefer a facing for a bicuspid that is a little longer than we usually select, and I cut on the occlusal surface a step or flat seat; into this seat and along the back of the facing I burnish No. 120 foil, and then on the foil I place a piece of ordinary backing. After I have swaged up a cusp of about No. 30 gauge gold it is all waxed together and invested. This method of backing takes the strain away from the pins and allows the gold to be of great strength at the weakest point, producing a finished tooth that shows no gold at all.—J. S. BRIDGES, *Dental Review*.

Temporary Crowns.—As a means of relieving the patient of disfigurement and embarrassment during the construction of a permanent crown, and for the purpose of facilitating the subsequent adjustment of the same by keeping the gums packed away nicely and exposing the end of the root, temporary crowns should invariably be employed in crowning anterior teeth. This expedient can be observed and such crowns constructed in a few minutes by selecting and adapting an ordinary facing and attaching a dowel made of German silver wire of proper size. The attachment may be made by flattening and notching one end of the dowel in such a manner as to engage the pins, and then bending them over upon it, or soft solder may be used if desired, and the crown then mounted with gutta-percha or temporary stopping. Whenever the time required to complete the construction of the permanent crown precludes finishing and mounting it on the same day that the root is prepared, the possible advantages resulting warrant the expenditure of time for this purpose.—HART J. GOSLEE, *Dental Review*.

Removing Silver Stains from the Fingers.—It is stated that silver stains can be removed from the fingers by dipping them into a mixture of copper sulfate 8 parts, hydrochloric acid 2 parts, and water 90 parts, subsequently washing in a sodium hyposulfate solution, using plenty of friction, and afterward rinsing with clear water. If there are any painful cuts or abrasions of the skin it will be advisable to use the acid more dilute than stated.—*Western Druggist*.

[Silver stains can also be removed by saturating them with iodine, which converts the silver salt into silver iodide; the latter is then removed with an application of a saturated solution of sodium hyposulphite.—Ed.]

"Don'ts" in Gold Filling.—

Don't attempt a gold filling where you haven't access to every part of the cavity.

Don't use a plugger point that gives anything but a direct blow.

Don't attempt a gold filling in a tooth that is void of proper support, natural or artificial.

Don't forget that the burnisher plays an important part in finishing a gold filling.

Don't endanger the cutting edge of an incisor for the sake of anchorage; rather groove toward the pulp-chamber.

Don't get it into your head that a porcelain inlay is a good substitute in the majority of cases for a gold filling. It is not.—R. G. McLAUGHLIN, *Dominion Dental Journal*.

Egotistic Motives.—When I see a man do another a good turn with all the while a hidden depravity in his heart and with an ulterior motive behind it, I am nauseated to the depths of my being, and shaken throughout my entire moral fiber. I care not how polished or accomplished a man may be, if he is not honest I want none of him. And the incomprehensible thing to me about most men with bad motives is that they so frequently delude themselves with the belief that they are deceiving the world as to their honesty. I do not believe it was ever the case that a man lived long in a community in close association with his fellows without at least some of them understanding his motives.—C. N. JOHNSON, *Dental Review*.

Hypnotism in Surgical Operations.—Hypnotic suggestion and suggestion without the aid of actual hypnotism have the same aim—to determine the subject's will in a certain direction—and have been used as a therapeutic measure from the earliest times. One may hypnotize a subject and suggest that all sensation of pain shall leave certain parts of the body, and the sensory nerves fail to fulfill

their functions and one may thrust a needle through the most sensitive tissues without any manifestation of pain whatever. Difficult operations, it is claimed, can be performed with no other anesthetic than the hypnotic assurance that no pain will be felt, the operator having absolute control over the nervous after-effects on the patient, shock being thus avoided.—H. A. BOYSEN, *Dental Brief*.

The Medically Educated Dentist.—As dentistry is a specialty of medicine, it behooves us to know something of medicine in general, as a specialist of orthodontia or any other specialty of dentistry would be expected to know something, at least, of the general practice of dentistry. Thus the intelligent dentist should have some idea of the different diseases that affect suffering humanity, in order to converse intelligently with his patients in reference to any ailment, or to discover any disease that may be causing trouble and annoyance to his patient. It is not necessary that he, the dentist, should know all in reference to the case, its diagnosis and prognosis, but he should have at least enough knowledge to advise his patient to seek the services of a physician.—J. S. McCURDY, *Dental Summary*.

Syrupy Solution of Cocain Phenate.—To lessen the pain during the operation of severe cases I make use of a concentrated, syrupy solution of cocain phenate, which I apply under the gum for about four to five minutes upon a small piece of cotton. This solution I have found to be the safest of all cocain solutions and mixtures I have ever employed. The carbolic acid of this preparation to a certain extent prevents the cocain from being absorbed, while the cocain, as long as the solution is saturated, inhibits the caustic action of the carbolic acid. When the calculary deposits have been removed and the pockets have been rinsed out with warm water and a suitable antiseptic, an application ought to be made of some medicine which will stimulate a new growth of the tissues surrounding the loosened teeth.—C. F. W. BÖDECKER, *Dental Review*.

Traumatic Impaction of Both Deciduous Centrals.—By the fall of a child of two and a half years (March 3, 1897) the centrals were driven into the adjacent tissues so far that the incisal edges scarcely appeared. Within an hour ether was administered, when the teeth were drawn into position, ligated to each other and to the laterals. Tincture of calendula one part to four parts of water was sprayed over the parts, and mild disinfection was

maintained for two days. The teeth became firmly attached in a short time and maintained indications of having living pulps. This condition was confirmed when, on their loosening, they were removed in December of 1899. The absorption of the roots was complete, leaving the residue of the living pulps in the caps of enamel. The permanent teeth did not appear until October 1900, at the age of six years.—L. J., *Internat. Dental Journal*.

Chronic Abscess.—A chronic abscess with a fistula is usually a condition favorable for successful treatment, especially so with roots of anterior teeth. Treatment may be thus outlined: Cleanse the canal with hydrogen dioxid, remove the contents. Work up to and through the apex with a fine Donaldson broach having the hook snipped off, followed by a spiral broach. With a hypodermic syringe force warm water into the canal and out through the fistula. Follow up with creasote and force through. Place a temporary dressing. The following day cleanse, flood the canal with a good antiseptic agent, dry, and fill at once. In a molar, with a probe find which root the fistula is from, if from only one; treat as described and fill that root. Treat the remaining canals and fill later. Be careful to avoid interference with the antrum.—JOHN E. WILKINSON, *Dominion Dental Journal*.

The Use of Paraffin as a Wound-Protective.—Springer (*Centralbl. f. Chir.*, June 14, 1902) states that a thin layer of paraffin forms an ideal protective for wounds. It has a smooth surface, does not adhere to the wound or sutures, remains pliable at body temperature, does not irritate the skin, is inexpensive, and can be made thoroughly aseptic. Prepare by dropping a small piece of paraffin with a melting-point of 45° to 47° C. into a shallow, covered vessel containing hot water, and boiling it for ten minutes. On cooling the paraffin hardens into a thin layer on the surface of the water. At a temperature of 40° C. the paraffin can be cut into suitable sizes and perforated by means of a hot needle as it floats on the water. By means of two pairs of forceps it is placed on the wound, where it readily adapts itself to the shape of the part, and is then covered with sterile gauze.—*Therapeutic Gazette*.

Sandarac Varnish for Starting Gold Fillings.—As a practical item, I desire to mention the use of sandarac varnish for starting gold fillings. I recently had a case where the cavity itself was retentive in shape, but presented no starting-point, nor could one be made at any place without undue risk. I placed

an infinitesimal atom of varnish at a convenient spot, and over this placed a piece of gold, pressing it to place. I then did the same at another point, and with a little careful manipulation built gold from one to the other until it was firmly held by the walls of the cavity. I am aware that other adhesive varnishes have been used for this purpose, but they are not of much use when we don't happen to have them, and it is well to know that at a pinch the ever-present sandarac varnish will take their place. It should be quite thick, say about like molasses in winter-time.—*Dental Brief*.

Cases in which "Immediate Root-Filling" is Contra-indicated.—The readers of dental periodicals have been surfeited with discussions on "immediate root-filling." If the advocates of this method are to be believed, it does not matter whether the operator has a case of incipient abscess or simply a hyperemia. In any event, proceed to fill at once and all things will end satisfactorily. Indeed, as one writer expressed it recently, "A simple discharge of pus, which can be stopped, is no bar to the immediate method." If effort be made to reduce the inflammation and cause a stoppage in the formation of pus, it is certainly not an immediate method of filling, for this treatment to be successful requires time. If the writer means that he places a filling in a canal with septic conditions and a primary abscess at the apex of the root, he takes risks that eminently entitle him to a suit for malpractice.—JAMES TRUMAN, *Internat. Dental Journal*.

Subperiosteal Abscesses in Patients Suffering from Pyorrhea.—Subperiosteal or "blind" abscesses are frequently met with in the mouths of patients suffering from pyorrhea alveolaris, and as they are not caused by the presence of septic matter in a pulp-canal they require different treatment. I have noticed that they occur more frequently upon the labial and buccal surfaces than upon the lingual surface of the alveolus, and in the majority of instances the pus finds its way along the neck of the tooth into the mouth. Whenever these abscesses require to be opened I accomplish it by means of a fine nerve-canal plugger, around which I wind a few fibers of cotton dipped into cocain phenate. The instrument is gradually introduced along the neck of the tooth into the abscess. If treated in this manner it gives but little pain. There being no open wound on the gum where particles of food can enter, the abscess heals readily and unless it recurs gives no more trouble.—C. F. BÖDECKER, *Dental Review*.

Aseptic Napkins.—I find that I am making more use of aseptic napkins and cotton rolls each month. I use the napkin by folding it much as I have always done the regular square linen napkin, turning one corner in about two inches and then folding it over and over until it makes a roll about a half-inch in diameter at the small end. I am also using absorbent cotton rolls more than ever. These are used under the lip in pieces about two inches long, and also between the cheek and the teeth in lengths of about one and one-half or two inches. By the aid of these absorbents I find that I can keep back the moisture long enough to do short operations. Another use that I make of the small cotton rolls is to cut them in lengths of about one-half inch, and use them for wiping the moisture from about the rubber dam after it has been applied. They are also useful in wiping about the teeth with alcohol preparatory to operating upon them. All of these preparations are to me great aids in my work, and I should be lost without them.—EDWIN T. DARBY, *Dental Brief*.

Method of Taking a Bite for Full Upper and Lower Dentures.—Make base-plates in the usual way, using pink or hard wax for the foundations, and softer wax for the ridges. Build the ridge on each base-plate as nearly as possible to a height corresponding with the length of the teeth to be used, and fill out where it is necessary, to restore the contour of the face. Try in each base-plate—the upper first—and note the effect as to contour and height of ridges and make necessary changes. Have the upper ridge extend below the upper lip as far as the cutting edges of the upper teeth should extend, and the lower ridge should be just visible when the mouth is open slightly. Have the patients close the jaws with the trial plates in position and be sure that the ridges meet evenly all around. Ascertain with an instrument inserted in the wax if the pressure is equally distributed throughout the bearing surfaces of the plates to the alveolar ridges. When assured of this fact, and having indicated the median and lip lines on the wax, fix the two trial plates together with small staples and remove from the mouth.—G. H. MADILL, *Dental Review*.

A Napkin Point.—There is one point that perhaps some of the younger men have not had demonstrated to them—insignificant, perhaps, but useful. If it is desired to keep dry a lower left tooth for ten, fifteen, or twenty minutes, act as follows: Fold or roll a napkin into a strip one and a half inches wide

and not less than seven or eight inches long. Have the patient raise the tip of the tongue to the roof of the mouth. Place the end of the napkin against the lingual surfaces of the lower right teeth and pass it across the mouth under the tongue to the lingual surfaces of the lower left teeth. Let the tip of the tongue be depressed. Pass the remainder of the napkin back across the mouth from left to right, this time over the tongue. Stand to the right and in front of your patient. Place a cotton roll between the cheek and upper left teeth to occlude the parotid duct. Hold the tongue firmly down against the floor of the mouth with the fingers of the left hand, the thumb being under the chin. The lower fold of napkin occludes the submaxillary and sublingual ducts, and the upper folds enable the operator to hold the tongue down without it slipping. The whole secret of success lies in keeping the tongue firmly down against the floor of the mouth. The patient may at first make unconscious spasmodic efforts to raise the tongue to swallow, but if it is held to place these efforts will cease.—GEO. E. HUNT, *Dental Brief*.

Conservatism in Root-Canal Treatment.—Other than the use of cocain and eucain, gradual approach to the pulp, and then pressure anesthesia, the general method is the use of arsenic, and here there is a difference, one dentist introducing the medicine for twenty-four hours and then removing the pulp, and another allowing the medicine to remain a week or more until sloughing has occurred, and then removing the contents of the pulp-chamber. In any case, however, whether in immediate devitalization of the pulp, arsenical application for twenty-four hours, or a lingering death, the radicals would fill at once upon removing the pulp. Perhaps in that I am somewhat "radical," for I sometimes do fill on such removal, no matter how I have destroyed the pulp; but on occasion I have had serious trouble by so doing. Probably it has been my own fault. I may not have removed the entire contents of the root-canals, etc., but the question under such circumstances comes home to me forcibly, Is this method right? Would it not be wiser to be more conservative, and after removing the pulp, especially when there is profuse hemorrhage, to give the wounded parts a chance to heal—let nature have control for a little while before sealing the canal? In the light of my own experience I cannot always feel that it is right to immediately fill, even under apparently favorable circumstances.—J. G. PALMER, *Internat. Dental Journal*.

OBITUARY.

DR. ARTHUR W. HOWLAND.

DIED, at Lawrence, Mass., January 6, 1903, of diabetes aggravated by an attack of grip, ARTHUR WASHINGTON HOWLAND, D.D.S.

Dr. Howland was born in Whitefield, N. H., May 23, 1844. He began the study of dentistry in 1864 under Dr. G. O. Rogers of Lancaster, N. H. Following this preliminary training he entered the Philadelphia Dental College in 1865, where he spent two years. At the conclusion of his course he entered

upon the practice of his profession, and in 1874, after having followed a course of lectures, he was graduated from the Boston Dental College.

Dr. Howland was a member of the Massachusetts Dental Society, of the Northeastern Dental Association, and of several Masonic orders.

His wife, two brothers, and a sister survive him, and together with his great host of friends deeply mourn his untimely death.

DENTAL LEGISLATION.

DENTAL LAW FOR THE PHILIPPINE ISLANDS.

AN ACT REGULATING THE PRACTICE OF DENTISTRY IN THE PHILIPPINE ISLANDS.

By authority of the United States, be it enacted by the Philippine Commission, that:

SECTION 1. The Commissioner of Public Health for the Philippine Islands shall appoint a Board of Dental Examiners for the Philippine Islands, with the advice and consent of the Board of Health for the Philippine Islands, consisting of three reputable practitioners of dental surgery, who shall be graduates in good standing of legally incorporated dental educational institutions recognized by the National Association of Dental Faculties and the National Association of Dental Examiners of the United States of America. They shall hold office for three years after their appointment, and until their successors are appointed and qualified: *Provided*, That the first appointees shall be appointed for a period of one, two, and three years, respectively, as specified in their respective certificates of appointment from the Commissioner of Public Health: *And provided further*, That no member of the faculty of any school, college, or university in which den-

tistry is taught shall be eligible for appointment on said Board. Each person appointed to the Board shall qualify by taking and subscribing the following oath of office:

"I, ..., having been appointed a member of the Board of Dental Examiners for the Philippine Islands, do hereby solemnly swear that I am a graduate in good standing of the at in the city of, that I will well and truly perform all the duties of said office, that I will faithfully account for all moneys coming into my hands as such officer, that I will bear true faith and allegiance to the Government of the United States, and that I take this oath without any mental reservation whatsoever. So help me God."

The oath shall be filed and recorded in the office of the Secretary of the Board of Health for the Philippine Islands.

The Commissioner of Public Health shall fill any vacancy that may occur in the Board within one month after the vacancy occurs. The person so appointed to fill a vacancy shall hold office only for the unexpired term of the member whose place he is appointed to fill.

The Commissioner of Public Health may, with the advice and consent of the Board of Health for the Philippine Islands, remove any

member of said Board for continued neglect of duty or incompetency, or for unprofessional or dishonorable conduct.

SEC. 2. The Board of Dental Examiners shall appertain to the Department of the Interior, so far as executive action may be required in connection with it. It shall organize immediately after the appointment of its members, and annually thereafter on the anniversary of its first organization, by electing from its members a president, who shall be its chief executive officer, and a secretary-treasurer. It shall procure and keep a seal with which to attest its official acts. The members of the Board, except the secretary-treasurer, shall receive as compensation the sum of two and a half dollars each for each candidate examined for registration as doctor of dental surgery, and two dollars for each person examined for registration as *cirujano ministrante*. The secretary-treasurer shall receive compensation at the rate of one hundred and fifty dollars per year, one-half of which amount shall be paid on the thirtieth of June and one-half on the thirty-first of December of each year. The amounts due the members of the Board of Examiners for compensation shall be paid from insular funds and disbursed by the disbursing officer of the Board of Health for the Philippine Islands. The secretary-treasurer shall execute a bond for five hundred dollars, with good and sufficient sureties, which shall be approved by the Treasurer of the Philippine Archipelago, conditioned that he will pay to the Treasurer of the Philippine Archipelago all moneys received by him as treasurer, and that he will faithfully discharge all the duties of his office. He shall keep a record of the proceedings of the Board, and a register of all persons to whom certificates of registration as dental surgeons or undergraduates in dentistry have been granted under the provisions of this Act, setting forth the name, age, sex, and place of business of each, his post-office address, the name of the dental educational institution from which he graduated or in which he has studied, and the date of such graduation or term of study, together with the time spent by him in the study of dentistry, and the names and locations of all other institutions which have granted to him degrees or certificates of clinics or lectures in dentistry, medicine or surgery.

SEC. 3. The Board of Dental Examiners shall meet in the city of Manila for the purpose of examining candidates desiring to practice dentistry in the Philippine Islands on the first Tuesdays of January and July of each year, after giving thirty days' written or printed notice of such meeting to each can-

didate who has filed his name and address with the secretary-treasurer of the Board, and after publishing such notice in one newspaper published in the English language and one newspaper published in the Spanish language at Manila at least once per week for a like period. The Board of Dental Examiners shall issue a dental surgeon's certificate to each candidate who furnishes satisfactory proof of having received a diploma as either doctor of dental medicine or doctor of dental surgery from a legally incorporated dental educational institution, and who in addition passes a satisfactory examination before the Board in the following subjects: Anatomy, physiology, histology, physics, chemistry, metallurgy, dental anatomy and physiology, dental materia medica, therapeutics, dental pathology and bacteriology, orthodontia, oral surgery, operative dentistry, and prosthetic dentistry. For each such certificate the secretary-treasurer of the Board shall collect a fee of ten dollars.

The Board is further empowered to make such rules and regulations not in conflict with the provisions of this Act as may be necessary to carry said provisions into effect.

SEC. 4. The Board shall, on or before the thirtieth day of June of each year, make a report to the Secretary of the Interior of its proceedings during the past year, and of all moneys received and disbursed by it during that period.

SEC. 5. Sixty days after the first meeting of the Board of Dental Examiners for the Philippine Islands and subsequent to the passage of this Act, it shall be unlawful for any person to practice dentistry in any of its branches in the Philippine Islands without a certificate of registration from the Board of Dental Examiners, or without having filed with the secretary-treasurer of said Board an affidavit, for the purpose of securing a registration certificate, setting forth the time and place in which he has practiced dentistry in the Philippine Islands prior to the passage of this law: *Provided*, That dentists who have passed successful examinations before a board established by the Provost-Marshal-General, city of Manila, pursuant to authority from the Military Governor of the Philippine Islands, dated August second, eighteen hundred and ninety-nine, shall be furnished with a certificate of registration by the Board of Dental Examiners on payment of the required fee for registration without further examination: *Provided also*, That nothing in this Act shall apply to dental surgeons of the United States Army on duty in the Philippine Islands, nor in any way apply to or affect any person who was resident in the Philippine Islands and

lawfully engaged in the practice of dentistry there prior to the passage of this Act: *And provided further*, That persons who have studied medicine in the Santo Tomas University at Manila for a period of not less than two years and who have received the title of "Cirujanos Ministrantes" and who have studied dentistry for the last four months of their course in such university, may be registered as undergraduates in dentistry upon passing a satisfactory examination before the Board, and, when so registered, shall be authorized to practice dentistry in remote towns where no regularly qualified dentist is available. The names of the towns in which each such undergraduate in dentistry is authorized to practice shall be included in his certificate of registration. The secretary-treasurer shall collect a fee of five dollars for each certificate of registration as undergraduate in dentistry issued by the Board.

SEC. 6. Every person engaged in the practice of dentistry in the Philippine Islands at the time of the passage of this Act shall within sixty days from the date of its passage register with the secretary-treasurer of the Board and pay the usual fee of registration, and the secretary-treasurer shall issue the usual certificate of registration to each person so registered. Any person failing to comply with this provision within the stated period shall be required to appear before the Board and pass a satisfactory examination before it shall be lawful for him to again engage in the practice of dentistry in the Philippine Islands.

SEC. 7. Any person shall be regarded as practicing dentistry within the meaning of this Act who shall for a fee, salary, or other reward, paid to himself or to another person, perform any operation or part of an operation upon the human teeth or jaws, or who shall restore lost teeth, jaws, or portions of jaws artificially, or who shall treat diseases or lesions or correct mal-positions thereof; but this provision shall not apply to artisans engaged in the mechanical construction of artificial dentures or other oral devices, or to students of dentistry practicing in any legally chartered dental school or college on patients under the direct supervision of an instructor in such dental school or college: *And provided further*, That this provision shall not be construed to interfere with physicians or surgeons in their legitimate practice as defined by Act numbered Three hundred and ten.

SEC. 8. Any two members of the Board may issue a temporary certificate of registration to an applicant upon the presentation by such applicant of satisfactory evidence that he possesses the necessary qualifications to practice

dentistry, such certificate to remain in force only until the next regular meeting of the Board, at which time the person to whom it has been issued shall report for examination. Temporary licenses shall be granted only when the Board is not in session and will not meet within thirty days. In no case shall a temporary certificate of registration be renewed or extended, nor shall a second temporary certificate be granted to any person. The fee for a temporary certificate of registration shall be five dollars, and the applicant shall further deposit with the secretary-treasurer of the Board the sum of five dollars to complete the payment of his fee for a regular certificate. He shall also file with the secretary-treasurer of the Board an affidavit to the effect that it is his intention to appear at the next regular meeting of the Board and to submit to an examination with a view to obtaining a permanent certificate. Should he appear and pass a satisfactory examination, a permanent certificate shall be granted to him without additional charge. Should he fail to appear and pass such examination, the money deposited by him shall not be returned to him, but shall be paid to the Treasurer of the Philippine Archipelago.

SEC. 9. The Board of Dental Examiners shall refuse to issue either of the certificates provided for by this Act to any person convicted by a court of competent jurisdiction of any criminal offense, or to any person guilty of immoral or dishonorable conduct or of unsound mind, and in the event of such refusal shall give to the applicant a written statement setting forth the reason for its action, which statement shall be incorporated in the record of the Board. The Board may revoke a certificate for like cause, or for unprofessional conduct after due notice to the person interested and on hearing, subject to an appeal to the Board of Health for the Philippine Islands, the decision of which shall be final.

SEC. 10. Every practitioner of dentistry shall display in a conspicuous place upon the house or office where he practices his full name, and he shall further display his certificate of registration in his office in plain sight of patients occupying his dental chair. Any person violating this provision shall, upon conviction, be punished by a fine of not less than twenty-five nor more than one hundred dollars for each offense. Any owner, proprietor or manager of a dental office or establishment who shall fail to cause to be displayed as provided in this section the registration certificate of each person practicing dentistry in such office or establishment shall, upon conviction, be punished by a like fine.

SEC. 11. No person shall in any way advertise as bachelor of dental surgery, doctor of dental surgery, master of dental surgery, licentiate of dental surgery, doctor of dental medicine, or dental surgeon, or append the letters B.D.S., D.D.S., M.D.S., L.D.S., or D.M.D. to his name, who has not had duly conferred upon him by diploma from some school, college, university or board of examiners legally qualified to confer the same, the right to assume said title, nor shall any person assume any title or prefix or append any letters to

his name to represent falsely that he has received a dental degree or certificate of registration. Any person violating this provision shall, upon conviction, be subject to a fine of not more than one hundred dollars or to imprisonment for not more than ninety days.

SEC. 12. Where the word "dollars" is used in this Act, it shall be understood to mean dollars in money of the United States.

SEC. 13. This Act shall take effect on its passage.

Enacted January 10, 1903.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS:

April, May, and June 1903.

APRIL.

CONNECTICUT STATE DENTAL ASSOCIATION. Hartford. Two days: April 21st and 22d.

MAY.

AMERICAN MEDICAL ASSOCIATION: SECTION ON STOMATOLOGY. New Orleans. May 5th to 8th.

ALABAMA DENTAL ASSOCIATION. Birmingham. May 13th.

ARKANSAS STATE DENTAL ASSOCIATION. Little Rock. Three days: May 12th, 13th, and 14th.

FLORIDA STATE DENTAL SOCIETY. Seabreeze Beach. May 27th.

ILLINOIS STATE DENTAL SOCIETY. Bloomington. May 12th.

INDIANA (EASTERN) DENTAL ASSOCIATION. Elwood. May 12th and 13th.

KANSAS STATE DENTAL ASSOCIATION. Emporia. Three days: May 14th, 15th, and 16th.

KENTUCKY STATE DENTAL ASSOCIATION. Bowling Green. Three days: May 25th, 26th, and 27th.

LAKE ERIE DENTAL ASSOCIATION. Cambridge Springs, Pa. Three days: May 19th, 20th, and 21st.

MARYLAND STATE DENTAL ASSOCIATION AND WASHINGTON, D. C., DENTAL SOCIETY UNION MEETING. Baltimore. Three days: May 21st, 22d, and 23d.

MISSISSIPPI DENTAL ASSOCIATION. Vicksburg. May 19th, 20th, and 21st.

MISSOURI STATE DENTAL ASSOCIATION. Kansas City. Three days: May 19th, 20th, and 21st.

NEBRASKA STATE DENTAL SOCIETY. Lincoln. May 19th to 22d.

NEW HAMPSHIRE DENTAL SOCIETY. Manchester. Three days: May 13th to 15th.

NEW YORK STATE DENTAL SOCIETY. Albany. Two days: May 13th and 14th.

NEW YORK—SIXTH DISTRICT DENTAL SOCIETY. Binghamton. May 7th and 8th.

OKLAHOMA DENTAL ASSOCIATION, Oklahoma City. Two Days: May 12th and 13th.

PENNSYLVANIA: SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA. Easton. May 13th, 14th, and 15th.

TEXAS STATE DENTAL ASSOCIATION. Houston. Three days: May 14th, 15th, and 16th.

WASHINGTON STATE DENTAL SOCIETY. Spokane. May 28th, 29th, and 30th.

WISCONSIN (SOUTHERN) DENTAL ASSOCIATION. Janesville. Two days: May 20th and 21st.

JUNE.

CALIFORNIA STATE DENTAL SOCIETY. San Francisco.

COLORADO STATE DENTAL ASSOCIATION. Denver. Three days: June 16th, 17th, and 18th.

GEORGIA STATE DENTAL SOCIETY. Tallulah Falls. June 9th.

IDAHO STATE DENTAL SOCIETY. Boise City. June 9th.

INDIANA STATE DENTAL ASSOCIATION. Indianapolis. Three days: June 30th, July 1st and 2d.

MASSACHUSETTS DENTAL SOCIETY. Boston. Two days: June 3d and 4th.

NORTH CAROLINA DENTAL SOCIETY. Winston. Three days: June 17th, 18th, and 19th.

State Board Meetings.

ALABAMA STATE BOARD OF DENTAL EXAMINERS. Birmingham. May 11th.

CONNECTICUT DENTAL COMMISSION. Hartford. May 21st, 22d, and 23d.

FLORIDA STATE BOARD OF DENTAL EXAMINERS. Seabreeze. May 26th.

GEORGIA STATE BOARD OF DENTAL EXAMINERS. Tallulah Falls. June 9th.

INDIANA STATE BOARD OF DENTAL EXAMINERS. Indianapolis. June 9th.

KANSAS STATE BOARD OF DENTAL EXAMINERS. Kansas City, Kan. May 4th to 8th.

LOUISIANA STATE BOARD OF DENTISTRY. New Orleans. May 5th.

MARYLAND STATE BOARD OF DENTAL EXAMINERS. Baltimore. May 6th and 7th.

MICHIGAN STATE BOARD OF DENTAL EXAMINERS. Grand Rapids. May 12th.

MISSISSIPPI STATE BOARD OF DENTAL EXAMINERS. Jackson. May 26th.

MISSOURI STATE BOARD OF DENTAL EXAMINERS. Jefferson City. May 12th.

NORTH DAKOTA BOARD OF DENTAL EXAMINERS. Grand Forks. July 10th.

NORTH CAROLINA STATE BOARD OF DENTAL EXAMINERS. Winston. June 15th.

OHIO STATE BOARD OF DENTAL EXAMINERS. Columbus. June 30th.

OKLAHOMA BOARD OF DENTAL EXAMINERS. Oklahoma City. May 11th and 12th.

RHODE ISLAND BOARD OF REGISTRATION IN DENTISTRY. Providence. June 29th.

VIRGINIA STATE BOARD OF DENTAL EXAMINERS. Richmond. June 9th.

WEST VIRGINIA STATE BOARD OF DENTAL EXAMINERS. Charleston. June 3d, 4th, and 5th.

FOURTEENTH INTERNATIONAL CONGRESS OF MEDICINE.

THE Fourteenth International Congress of Medicine will be held in Madrid, under the auspices of their majesties King Alphonso XIII and the Queen-Regent, April 23 to 30, 1903. The Congress will be composed of physicians, pharmacists, dentists, veterinarians, and all others who practice any branch of the healing art.

The registration fee is thirty pesetas (about \$6.00). The amount of this fee must be paid to the secretary-general of the Congress, Faculty of Medicine, Madrid, who will in turn forward to the applicant an identification card. Each member should forward with his registration fee a memorandum in which his full name, titles, and address should appear. These data should be accompanied by the member's visiting card.

The official languages of the Congress will be Spanish, French, English, and German.

The committee of organization of Section XII, in which dentists are especially interested, is as follows: Luis Guedea, professor of the Faculty of Medicine, president; R. Sanchez, vice-president Spanish Odontological Society, and H. B. Heddy, vice-presidents; Florestán Aguilar, professor odontology, Univ. Madrid, secretary-general; I. Gallardo, L. Subirana, J. D. Losada, adjunct secretaries.

All correspondence regarding the work of the section should be addressed to the secretary, Dr. Florestán Aguilar, Serrano 5, Madrid.

EASTERN DENTAL SOCIETY OF THE CITY OF NEW YORK.

THE Eastern Dental Society of the City of New York holds its meetings on the first Thursday of every month, at 235 East Broadway.

Officers: Joseph Harvitt, president; J. E. Carlin, vice-president; Elias Gluskin, treasurer; Dorothy J. Maryson, secretary. Trustees—A. Greenberg, H. Schwartz, and A. Lifshutz.

DOROTHY J. MARYSON, *Sec'y*.

NEW YORK ODONTOLOGICAL SOCIETY.

AT the regular meeting of the New York Odontological Society, held December 16, 1902, all of the officers for the year 1902 were re-elected for the year 1903, as follows: J. F. P. Hodson, president; John I. Hart, vice-president; W. J. Turner, recording secretary; W. D. Tracy, corresponding secretary; F. C. Walker, treasurer; J. Adams Bishop, curator; Ellison Hillyer, editor. Executive Committee—F. T. Van Woert, F. B. Keppy, W. D. Tracy (chairman). Clinic Committee—S. G. Perry, L. C. LeRoy, W. W. Walker (chairman).

W. D. TRACY, *Cor. Sec'y*, 46 W. 37th st.

ODONTOGRAPHIC SOCIETY OF CHICAGO.

OFFICERS FOR 1903.

At the annual meeting of the Odontographic Society of Chicago in December, the following officers were elected for 1903: F. B. Noyes, president; J. P. Buckley, vice-president; F. H. Zinn, secretary; G. N. West, treasurer. Board of Directors—F. E. Roach, L. O. Green, H. A. Drake. Censors—D. M. Cattell, W. Girling, D. A. Hare.

FRANK H. ZINN, *Sec'y*,
100 State st., Chicago, Ill.

HARVARD ODONTOLOGICAL SOCIETY.

THE annual meeting and banquet of the Harvard Odontological Society was held at Young's hotel, Boston, February 28, 1903. An illustrated lecture on "Argentina" was given by Mr. George H. Worthley, of Brookline, Mass. Music was furnished by Mrs. William B. Eddy and Mr. W. S. Kerr. There were seventy-one members and guests present.

The officers elected for the ensuing year are—Julius G. W. Werner, president; John W. Estabrook, recording secretary; Arthur H. Stoddard, corresponding secretary; H. Winchester Hardy, treasurer; Horace L. Howe, editor. Executive Committee—John W. Estabrook, William P. Cooke, Lyman F. Bigelow.

ARTHUR H. STODDARD, *Cor. Sec'y*.

INSTITUTE OF DENTAL PEDAGOGICS.

At the recent meeting of the Institute of Dental Pedagogics, held in Chicago on December 29, 30, and 31, 1902, the following officers were elected for the ensuing year: J. D. Patterson, Kansas City, Mo., president; H. B. Tileston, Louisville, Ky., vice-president; W. Earl Willmott, Toronto, Can., secretary-treasurer. Executive Committee—W. H. Whitslar, Cleveland, Ohio; D. R. Stubblefield, Nashville, Tenn.; R. H. Nones, Philadelphia, Pa.

The next meeting will be held at Buffalo, December 29, 30, and 31, 1903. Those having new teaching appliances which they wish to bring before the Institute will communicate with Dr. Wm. G. Foster, Baltimore, Md., or Dr. L. S. Tenney, Chicago, Ill.

KENTUCKY STATE DENTAL ASSOCIATION.

CHANGE OF DATE OF MEETING.

THE Kentucky State Dental Association will hold its annual meeting May 25, 26, and 27, 1903, at Bowling Green.

C. R. SHACKLETTE, *Sec'y*,
636 Fourth ave., Louisville, Ky.

OKLAHOMA DENTAL ASSOCIATION.

CHANGE OF DATE OF MEETING.

THE meeting of the Oklahoma Dental Association will take place a few days later than as previously announced. It will be held May 12 and 13, 1903, at Oklahoma City, O. T.

R. H. PENDLETON, *Sec'y*, Norman, O. T.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE thirty-ninth annual convention of the Connecticut State Dental Association will be held at Hartford, on Tuesday and Wednesday, April 21 and 22, 1903.

FREDK. HINDSLEY, *Sec'y*,
Bridgeport, Conn.

KANSAS STATE DENTAL ASSOCIATION.

THE Kansas State Dental Association will hold its regular annual meeting on Thursday, Friday, and Saturday, May 14, 15, and 16, 1903, at Emporia, Kan.

G. A. ESTERLY, *Sec'y*, Lawrence, Kan.

NEW YORK STATE DENTAL SOCIETY.

THE thirty-fifth annual meeting of the New York State Dental Society will be held Wednesday and Thursday, May 13 and 14, 1903, in the assembly hall, Hotel Ten-Eyck, Albany, N. Y.

The following well-known members of the profession will present papers on subjects to be announced: E. C. Kirk, Philadelphia, Pa.; M. L. Rhein, New York, N. Y.; Edward J. Line, Rochester, N. Y.; R. M. Sanger, East Orange, N. J.; J. F. Knapp, Geneva, N. Y.;

F. T. Van Woert, Brooklyn, N. Y.; H. D. Hatch, New York city, N. Y.; A. R. Cooke, Syracuse, N. Y.

Exhibitors desiring space will communicate with Dr. J. R. Appleton, 89 Columbia st., Albany, N. Y.

Members of the profession are cordially invited. Headquarters, Hotel Ten-Eyck.

R. H. HOFHEINZ, *Pres.*, Rochester, N. Y.

W. A. WHITE, *Sec'y*, Phelps, N. Y.

NEW HAMPSHIRE DENTAL SOCIETY.

THE annual meeting of the New Hampshire Dental Society will be held at Manchester, N. H., in the Board of Trade rooms, on May 13, 14, and 15, 1903. All members of the profession are cordially invited to be present.

FRED. F. FISHER, *Sec'y*.

EASTERN INDIANA DENTAL ASSOCIATION.

THE Eastern Indiana Dental Association will hold its annual meeting at Elwood, Ind., May 12 and 13 1903. Efforts are being made to have a large and profitable meeting. Prominent members of the profession will present papers and the clinics will be of special interest. All members of the profession are cordially invited.

P. H. CHADWICK, *Sec'y*, Rushville, Ind.

NEBRASKA STATE DENTAL SOCIETY.

THE Nebraska State Dental Society will hold its annual meeting in Lincoln, Neb., May 19-22, 1903.

The profession cordially invited.

H. R. HATFIELD, *Cor. Sec'y*.

TEXAS STATE DENTAL ASSOCIATION.

THE Texas State Dental Association will hold its twenty-third annual meeting in the city of Houston, May 14, 15, and 16, 1903. This meeting promises to be the best ever held in Texas. All members of the profession are invited to attend.

BUSH JONES, *Sec'y*, Dallas, Tex.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

THE Southern Wisconsin Dental Association will hold its annual meeting at Janesville, Wis., May 20 and 21, 1903.

Every effort is being made to have a large and interesting meeting. Prominent members of the profession will present papers, and some of the most noted clinicians will operate.

All reputable members of the profession are cordially invited.

C. W. COLLVER, *Sec'y*, Clinton, Wis.

MASSACHUSETTS DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Massachusetts Dental Society will be held in Boston, in Mechanics Building, on Wednesday and Thursday, June 3 and 4, 1903.

EDGAR O. KINSMAN, *Sec'y*,
Cambridge, Mass.

INDIANA STATE DENTAL ASSOCIATION.

THE forty-fifth annual meeting of the Indiana State Dental Association will be held at Indianapolis, June 30, July 1 and 2, 1903. A splendid program is being arranged by the executive committee, and a most cordial welcome will be extended to those who attend.

F. R. McCLANAHAN, *Sec'y*.

FLORIDA BOARD OF DENTAL EXAMINERS.

THE Florida State Board of Dental Examiners will meet at Seabreeze, Fla., on the 26th day of May 1903. All applicants for examination are requested to be present on that date.

E. M. SANDERSON, *Sec'y*.

OKLAHOMA BOARD OF DENTAL EXAMINERS.

THERE will be a meeting of the Oklahoma Board of Dental Examiners held in Oklahoma City on May 11 and 12, 1903, for the purpose of examining candidates for license. All applications must be in the hands of the secretary by May 1st, that arrangements may be made for practical work.

A. C. HIXON, *Sec'y*, Guthrie, O. T.

KANSAS BOARD OF DENTAL EXAMINERS.

THE Kansas State Board of Dental Examiners will meet at Kansas City, Kan., May 4 to 8, 1903. The examination will be theoretical and practical. Applicants must provide their patients, instruments, and materials, and be prepared to construct a plate and crown, and insert a gold, amalgam, and cement filling. The theoretical examination will be the same as usually given at such times. For particulars address

J. P. Root, *Sec'y*,
Kansas City, Kan.

GEORGIA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of Georgia will meet at the Capitol in Atlanta in called session on the 27th day of April 1903, and at Tallulah Falls on the 9th day of June 1903, for the purpose of examining applicants for license and of transacting such other business as may appear. All applicants for licenses will be required to present their diplomas for examination before their names will be enlisted.

JOHN H. COYLE, *President*.
D. D. ATKINSON, *Sec'y*.

MARYLAND BOARD OF DENTAL EXAMINERS.

THE Maryland State Board of Dental Examiners will meet for the examination of candidates for certificates on Wednesday and Thursday, May 6 and 7, 1903, at the Dental Department of the Baltimore Medical College, North Howard st., Baltimore, Md., at 9 A.M.

Candidates must pass a written examination in operative and mechanical dentistry, anatomy and physiology, pathology, therapeutics, and materia medica, chemistry, bacteriology, and oral surgery; must insert a good filling in the mouth and exhibit specimens of prosthetic work properly vouched for.

Applications must be filed prior to May 6th, accompanied by the fee of ten dollars.

For further particulars apply to

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

ALABAMA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners for the State of Alabama will meet in Birmingham, Ala., on Monday before the second Tuesday in May 1903. In addition to the regular written examination, the following requirements will be added, viz: Each applicant must fill at least two teeth, approximal cavities, one with gold, the other with alloy, work to be done under the immediate supervision of the board. The board to determine or pass on suitable selections of cavities. Board will try to furnish subjects, but failing to do so, applicants for license must find or bring their own subjects, also instruments and material.

Each applicant must bring a partial upper denture (not less than eight teeth) ready for soldering, hard solder required, which work must also be done under the supervision of the Board.

THOS. P. WHITBY, *Sec'y*.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING FEBRUARY 1903.

February 3.

- No. 719,834, to JOHN MILLS. Dental matrix-retainer.
No. 719,928, to EVART V. WILLIAMS. Manufacture of dental crowns.
No. 719,964, to WALTER F. WHEELER. Artificial tooth.

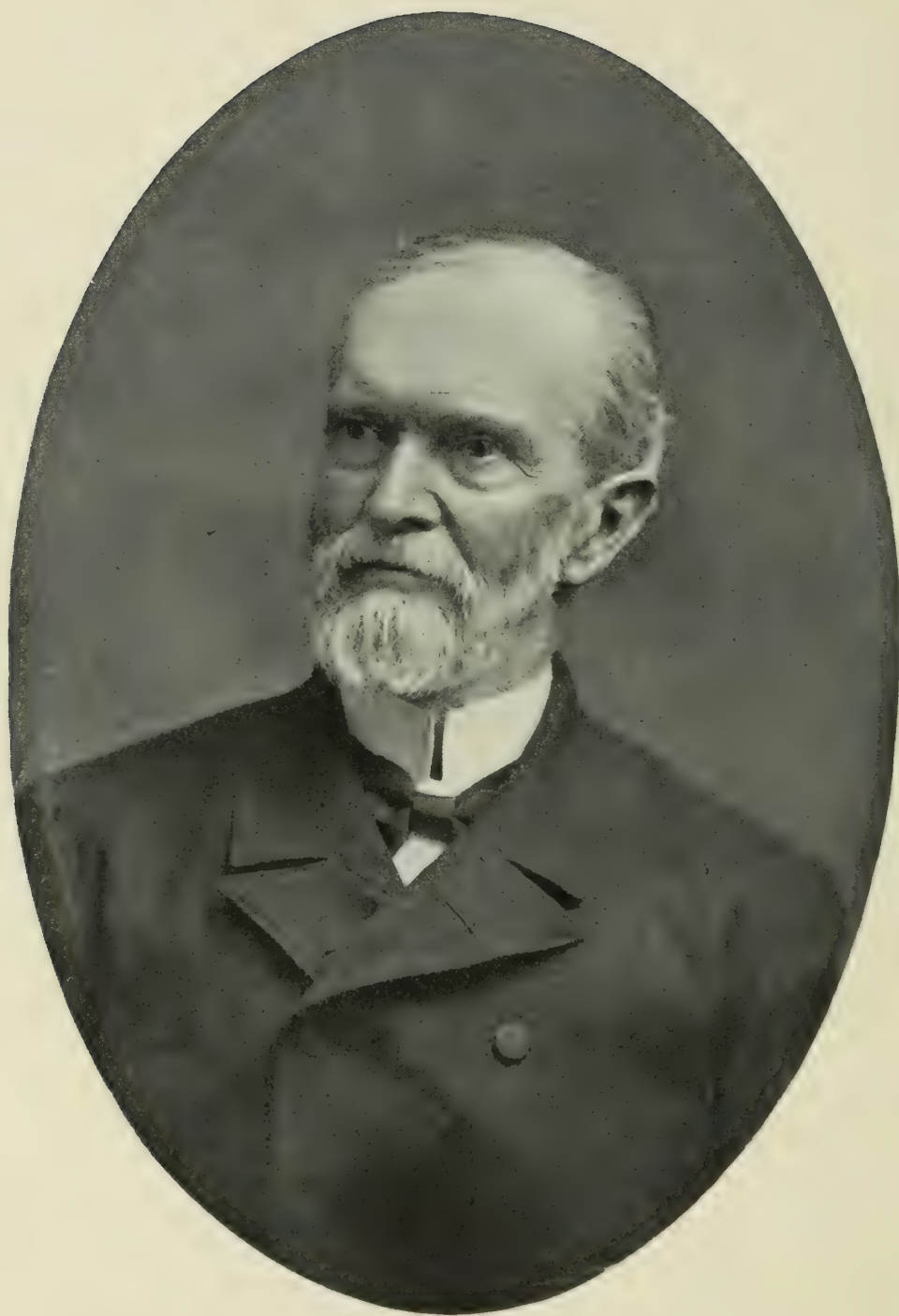
February 10.

- No. 720,024, to JOHN F. HAMMOND. Electric furnace.

- No. 720,071, to JOSEPH I. RICHARDS. Hot-air syringe.
No. 720,102, to GEORGES A. BROUILLET. Dental impression cup.
No. 720,394, to LOUIS ARNDT. Dental charcoal point.

February 24.

- No. 721,185, to WILLIAM A. HECKARD. Apparatus for administering anesthetics.
No. 721,528, to ORMOND E. WALL. Rack for holding false teeth.



Treaturnally yours

S. B. Palmer

THE DENTAL COSMOS.

VOL. XLV.

MAY, 1903.

No. 5.

ORIGINAL COMMUNICATIONS.

THE STRUCTURAL CHARACTERISTICS OF THE CALCIFIED DENTAL TISSUES AS RELATED TO THE QUESTION OF SO-CALLED “HARD” AND “SOFT” TEETH.

By EDWARD C. KIRK, D.D.S., Sc.D., Philadelphia, Pa.

(Read before the New York Odontological Society, January 20, 1903.)

I AM sure that no one in this audience will wish to gainsay me when I state as my belief that the profession of dentistry is under a heavy debt of obligation to Dr. G. V. Black for his many contributions to dental science and art; but I am not so sure of my ground when I state as my belief that for no one thing he has done are we more indebted to him than for his splendid work in connection with the “Physical Characters of the Human Teeth in Relation to Their Diseases,” published during the year 1895. I fully appreciate the fact that there are those among us who are inclined to doubt the practical value of what may at first sight seem to be only a scientific search for an abstract truth which even when found is not apparently convertible into terms of dollars and cents. I am also aware that there are honest doubters in our ranks who question the soundness of Dr. Black’s conclusions for the reason that they are antagonistic to the conclusions and beliefs which through all pre-

vious time have been drawn from the data of clinical observation. Nevertheless, from a very close study of the premises upon which the conclusions have been reached and from investigation bearing upon the same subject which I have myself made, I am fully convinced that the principal deductions made by Dr. Black from his extensive experimental study of the physical characters of the teeth are sound and trustworthy.

My task this evening, therefore, is to attempt to reconcile the conflicting views on this subject by asking your attention to some side lights on the question which my studies of it, particularly for the past year, have developed.

Dr. Black’s deductions regarding the physical characters of the teeth are best stated in his own words, which I here quote:

“The teeth are strongest in youth and early adult age, diminishing somewhat in strength with advancing age.

“Teeth that have lost their pulps and

have become discolored lose strength in a marked degree, apparently from deterioration of the organic matrix.

"Teeth that have become badly worn from mastication and in which the pulps become so much calcified as to cut off nutrition of the crown portions of the dentin, lose strength, apparently from deterioration of the organic matrix.

"Teeth of old people, and especially those in which much calcification of the pulps occurs, deteriorate in strength.

"There is no basis for the supposition that the teeth of children under the age of twelve years are too soft to receive metallic fillings.

"Differences in density or in percentage of lime salts in the teeth are not the controlling factors in the strength of the teeth nor their hardness, this seeming to depend upon the condition of the organic matrix.

"Differences in strength of the teeth have no influence as to their liability to caries. Differences in the density or in the percentage of lime salts have no influence as to their liability to caries.

"The active cause of caries is a thing apart from the teeth themselves, acting upon them from without, and, from a consideration of the facts thus far developed, the logical inference is that the cause of the differences in the liability of individuals to caries of the teeth is something in the constitution, operating through the oral fluids and acting upon the active cause of caries, hindering or intensifying its effects.

"Caries of teeth is not dependent upon any condition of the teeth, but upon conditions of their environment.

"Imperfections of the teeth, such as pits, fissures, rough or uneven surfaces, and bad forms of interproximate contact, are all causes of caries only in the sense of giving opportunity for the action of the causes that induce caries.

"The objects that are to be attained in filling teeth are the perfect exclusion of the causes of caries from the tissues by sealing the cavity and securing such form as will prevent lodgments of débris about the margins of the filling, and

thus prevent the further action of the cause of caries.

"There is no basis for the supposition that some teeth are too soft or too poorly calcified to bear filling with gold or other metal in use for that purpose, since all are found to be abundantly strong.

"There is no basis for the selection and adaptation of filling material to soft teeth, hard teeth, frail teeth (in structure), or poorly calcified teeth. What basis there may be in the condition surrounding the teeth for the selection and adaptation of filling materials must be left to future developments to discover.

"With our present knowledge the only basis for the selection and adaptation of filling materials to classes of cases is the individual operator's judgment as to which he can so manipulate as to make the most perfect filling, considering the circumstances, his own skill, and the durability of materials.

"There is no basis for the supposition that calcic inflammation of the peridental membrane or phagedenic pericementitis (so-called pyorrhea) attacks persons who have dense teeth in preference to those whose teeth are less dense.

"There is no basis for the treatment of pregnant women with the view of furnishing lime salts to prevent the softening of their teeth or with the view of producing better calcified teeth in their offspring."

The announcement of these conclusions, in many respects so iconoclastic in character, aroused much criticism and expression of doubt from those who had reasoned wholly from the standpoint of clinical observation and experience. We had become so accustomed to believe in "hard teeth," "soft teeth," "dense teeth," "poorly calcified teeth," etc., that to have the beliefs of accumulated experience thus suddenly set aside was not to be thought of seriously for a moment unless a more satisfactory explanation of the clinically observed textural differences in tooth-structure were presented.

It will be seen that Dr. Black's conclusions naturally fall under a few categories. Thus he finds that—

There are certain variations in the

density, hardness, and chemical composition of the teeth.

These variations are, as a matter of fact, extremely limited in degree.

Their relation to age is equally slight, and to sex not noticeable.

The minimum of density and hardness at any age is more than sufficient to warrant the use of gold or other metal as a filling material in so far as its use is related to the factors of density and hardness of tooth-structure.

The differences in structure, composition, density, or hardness of teeth are factors which do not affect the liability of teeth to decay, because the active causes of decay are factors of the environment of the tooth and not of the tooth itself.

These deductions, though perfectly logical inferences from the laboratory experiments on which they were based, were nevertheless discredited in the minds of many simply because they were laboratory experiments, and were therefore not to be compared for a moment with the impressions received through the cultivated tactile sense and trained powers of observation of the skilled clinician.

The differences of opinion as expressed in Dr. Black's conclusions on the one hand and those of the great body of clinical observers on the other, may, I think, be fairly attributed to the differences in method of observation respectively employed in dealing with the question of the physical characters of the teeth.

PRECISION OF NOMENCLATURE.

Laboratory methods of research are necessarily precise in character, and involve, as in this case, a precise definition of the terms used to designate the physical properties of the teeth proposed to be studied. Consequently in Dr. Black's research he has expressed his conclusions as to density, hardness, etc., as those terms are scientifically used in connection with the physical properties of matter in general to which they may be applicable, and his methods were the

recognized methods of scientific precision modified to meet the peculiarities of the material studied. Therefore when Dr. Black reports that certain specimens of tooth-structure show stated variations in density he means that they present certain variations in the ratio of their equal mass volumes, or otherwise a difference in specific gravity, while to the clinical observer the term density of tooth-structure probably means a peculiar appearance of texture, and certainly it means resistance to the action of cutting instruments, qualities by no means dependent upon the physical property which Dr. Black precisely expresses by the term density.

This difference in meaning of the terms employed cannot be too strongly emphasized, for it leads to confusion not only in the interpretation of the meaning of Dr. Black's figures and conclusions, but to an equal misunderstanding of the contention of the clinical observer. It will perhaps be remembered by some of those now present that in a paper presented to this society in January 1896 by Dr. Black he distinctly stated that his experiments did not include a study of "the variations of the hardness of the teeth to cutting instruments." His conclusions as well as his experiments are, then, to be studied and judged strictly within the limitations which their author has prescribed, for only in that way can we derive from them the information they are capable of furnishing.

In the light of what we now know about the etiology of the active cause of caries from the work of Professor Miller and the supporting testimony which the researches of Drs. J. Leon Williams and G. V. Black contribute thereto, the statement of the latter that the physical and chemical characters of the tooth have no influence affecting the liability of the tooth to decay may be taken as a demonstrated fact. In short, the results of modern research point definitely to the conclusion that no tooth will decay in an environment which is not infected with the active bacterial causes of caries, while any tooth will decay in an environment which is thus infected.

We are compelled to dismiss, then, all conclusions affecting modes of practice which are based upon the idea that differences in tooth-structure *per se*, either physical or chemical, influence the liability of teeth to decay. There is one modifying factor which in this connection must be considered and given its due weight in determining the relations of tooth-structure to the influences of a caries-producing environment, viz, that differences in tooth-structure undoubtedly influence to some extent the rate of decay and probably modify to some extent also its clinical expression. J. Leon Williams and others have shown that in the carious disintegration of enamel it is the interprismatic substance that first succumbs to the solvent action of the decalcifying acid, and we know from the study of carious action in dentin that in its progress it tends to follow certain lines which we must conclude under the particular circumstances involved in any given case are lines of least resistance to the carious invasion determined by the relatively greater solubility of the calcified structure in the acid end-products of caries-producing bacteria. This is a factor which modifies exclusively the *rate* of decay and not at all the *liability* to decay. Hence the differences in chemical composition and of physical structure in teeth relate not to caries, but to quite another kind of conditions, viz, conditions involving resistance of the teeth to the stress of mastication, the abrasive action of food material, the triturating action of occlusal contact, and, in so far as their rate of solubility in acid secretions is concerned, the phenomena of erosion.

The clinically observed freedom from caries of the teeth of certain individuals affected with phagedenic pericementitis of a particular type has given rise to the frequently expressed belief that the "hard, dense" teeth of pyorrheal patients are more resistant to caries than are certain other types of teeth. The reasoning in this connection is defective, because it is assumed that the type of pyorrheal teeth under consideration are

more hard and dense than certain other teeth affected by caries. This Dr. Black's researches have shown to be not the case when the qualities under consideration are determined by the specific gravity test and by chemical analysis. Again, the clinical reasoning is defective in this connection because in crediting the freedom from caries to a supposed superior density and hardness, it is implied that the active causes of caries are at the same time factors of the environment of the teeth in question, which we now have ample reason to believe is not the case. The supposition that the exciting causes of caries are a factor of the problem in these cases of observed immunity from dental caries where certain forms of pyorrhea exist is of a type of logical reasoning quite analogous to that employed by the old darky preacher who in his Sunday sermon dogmatically asserted that every woman was possessed of seven devils, and who when afterward called upon by one of his parishioners to defend his assertion indulged in the following line of argument: "You's read in de Bible 'bout dem seben debbils bein' cast out ob Mary Magdalene, ain't yo?" "Yes." "Well, did yo ebber hear 'bout 'em bein' cast out ob any udder woman?" "No." "Well, den, dey's all got 'em yit." Freedom from caries means simply absence of the combination of causes which produce caries, not some peculiarity of tooth-structure capable of successfully resisting caries when its causes are a factor of the environment.

THE DIATHETIC FACTOR.

Teeth of a certain texture and physical character such as are observed in connection with certain pyorrheal conditions do decay less frequently than teeth of certain other texture and character,—not, however, because of the nature of their composition or texture, but because these so-called hard or dense teeth are associated with a diathetic condition which is not susceptible to caries. Indeed, there is good reason to believe that the nutritional state in gouty or arthritic pyorrheal conditions is one

which so alters the composition of the oral fluids as to make them unsuitable as a medium in which the bacteria of caries can thrive. Not only that, but we may strongly suspect that the nutritional fault which gives rise to the diathetic state in question is the predisposing cause of the immunity to caries, the pyorrheal factor, and the peculiar textural conditions which these particular teeth present.

It is not my purpose, nor would the time at our disposal make it possible, to give a detailed critical exhibit of the wide applicability of Dr. Black's research to the clinical and pathological phenomena to which it relates. My object has been to establish a basis of understanding of the meaning of his research, so that we might judge of it strictly upon its merits and within the limitations he himself has prescribed, and thus be able to use it as a basis for a step forward in the study of some phenomena to which it is closely related. I desire now to consider with you some of the allied questions which clinical experience has raised in connection with the structure and composition of the teeth, and to ask your attention to a mode of investigating them which to me seems pregnant with possibilities.

PHYSICAL DIFFERENCES AND MOLECULAR ARRANGEMENT.

It should be noted that nowhere does Dr. Black deny the fact that there are differences both as to density and composition of the teeth. On the contrary, his researches clearly show that such differences exist not only as among individuals but also as among teeth of the same individual. He has, however, studied these differences only as they are indicated by chemical composition based upon ultimate gravimetric analysis, resistance to crushing stress, and by specific gravity determinations,—all of which are methods yielding results which, though important and valuable as far as they go, fall short, in my judgment, of solving the problem in one important particular, viz, *the differences in structure which*

arise out of the variations in the state of molecular aggregation of the calcified tissues of the tooth.

In the discussion of Dr. Black's paper before this society in January 1896,* I noted a lack of correspondence between the density of certain experimental fillings and their resistance to stress as reported by the essayist, and suggested that it might be due to a difference in molecular arrangement of the filling material resulting from a difference in manipulation.

Again, in the discussion following the reading of a paper by Dr. J. Leon Williams before this society, January 1897,† I called attention to this factor of the variation in molecular arrangement of the calcoglobulin of the enamel as a possible explanation of the observed difference in the solubility of the interprismatic substance and the enamel rods respectively, as possibly having some bearing upon the relative rate of decay of different tooth-structures.

I am still impressed with the importance of a consideration of the minute physical structure—the manner in which the ultimate particles of the tooth are put together—as having much to do with the physical properties manifested by the tooth as a whole.

We may build a wall of given dimensions out of bricks and mortar, but the ability of the wall to withstand stress or the operation of other forces tending to disintegrate it will be profoundly modified by the manner in which the structural units of the mass are assembled. Thus a wall of bricks may be laid end on end, edgewise or sidewise, in Flemish bond or herring-bone fashion—i.e. in diagonal rows—and when completed the wall in each case will be of the same dimensions, contain the same cubical mass of matter, or, to complete the analogy, would show the same results expressed in terms of percentage composition upon analysis, yet the structural value measured in terms of endurance of disruptive agencies of various sorts

*DENTAL COSMOS, vol. xxxviii, page 334.

† *Ibid.*, vol. xxxix, page 413.

would necessarily vary comparatively with the structural peculiarities.

The influence of the state of aggregation in modifying the physical properties of matter is well known. In certain elementary substances—phosphorus, carbon and sulfur, for example,—we have marked physical variations due to allotropy, giving us the red amorphous and the waxy varieties of phosphorus, the graphitic and diamond varieties of carbon and the crystalline and amorphous plastic conditions of sulfur; while for compound matter we have analogous physical variations due to differences in atomic groupings in compounds having exactly the same chemical composition,—a condition known to chemists as isomerism.

There is no *a priori* reason why analogous differences in the aggregation of the ultimate particles of a tooth should not occur, and when they do we should expect that corresponding differences in physical characteristics would result.

THE ORGANIC MATRIX AND HYDRATION.

Dr. Black is inclined to attribute considerable influence to the condition of the organic matrix of the tooth in determining its density and resistance to crushing stress,—a deduction which his experiments clearly warrant. The relation of the organic matter of the tooth to the water of composition is a problem having an important bearing upon the physical properties of tooth-structure and one upon which further research is needed. Black's experiments fail to differentiate clearly between water of composition, *i.e.* the degree of chemical hydration of the calcoglobulin and water of structure, that taken up by simple imbibition. In an investigation of the chemical composition of enamel by Charles Tomes (*Journal of Physiology*, 1896, vol. xix, No. 3) he shows very clearly that the chemically combined water in the enamel is one of its characteristic features; and further, that errors in analyses of enamel previously reported undoubtedly exist owing to the failure to take account of the chemically

combined water which by the mode of analysis employed has probably been recorded as organic matter, thus creating an erroneous idea as to the amount of organic matter present in the enamel. The same source of error has probably arisen in studies of the chemical composition of dentin, for, as the studies of Black show, there appears to be an increase of hardness or brittleness in teeth which rather closely follows a decrease in their proportion of combined water,—a change not altogether unconnected with changes in the physical properties of the teeth concurrent with advancing age.

The exact nature of the chemistry of calcification needs more precise elucidation. The experiments of Mr. Rainie, which were later elaborated by Professor Harting, gave us much light upon the combination of calcium salts with albuminoid material, and particularly as to the physical character of the calcospherite which may be regarded as the structural unit of the calcified tissue. This work was done over forty years ago, and so far as I am aware the chemical composition of so-called calcoglobulin, the material out of which the calcospherite is built, is only superficially understood. Such investigation of the subject as I have been able to make leads me to suspect that calcoglobulin of calcifying tissues is for the most part a compound formed between the nuclein of the cell and the basic phosphates of calcium, and, as the calcium phosphates are several in number and tend to form complex double salts, it is highly probable that the calcoglobulin concerned in tooth-calcification is of variable composition depending greatly upon the character of the nutritional state during the period of tooth-formation.

THE POLARISCOPIC METHOD.

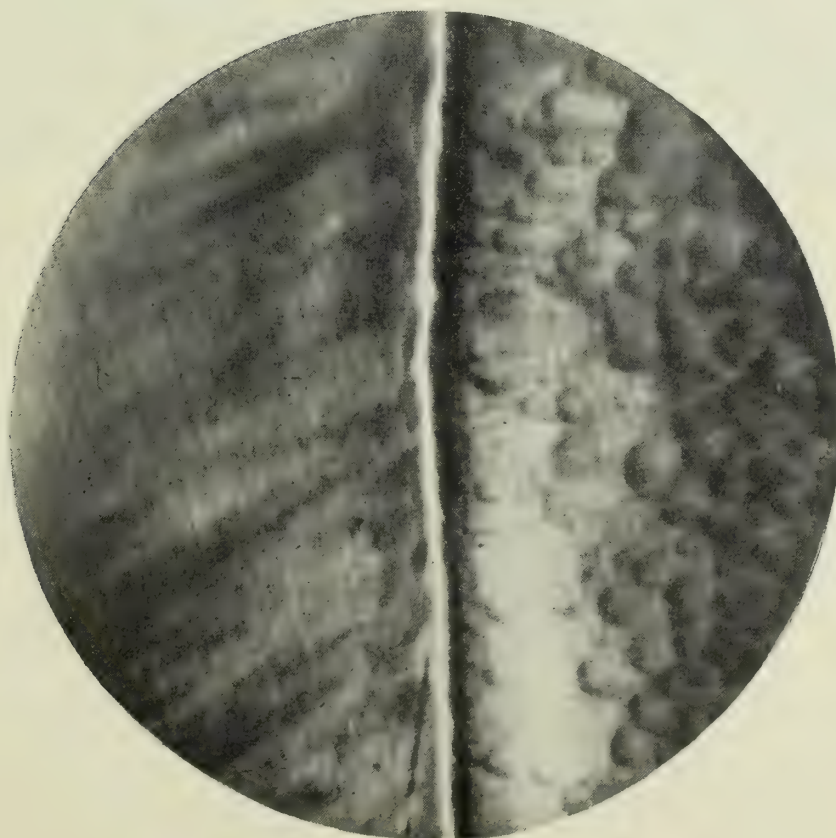
A consideration of these questions led me to the conclusion that to gain light upon the intimate structural characteristics of the teeth necessitated the employment of methods other than those directed toward an understanding of

FIG. 1.



Enamel and dentin of deciduous molar. ($\times 110$.)

FIG. 2.



Same as Fig. 1. Photographed by polarized light.

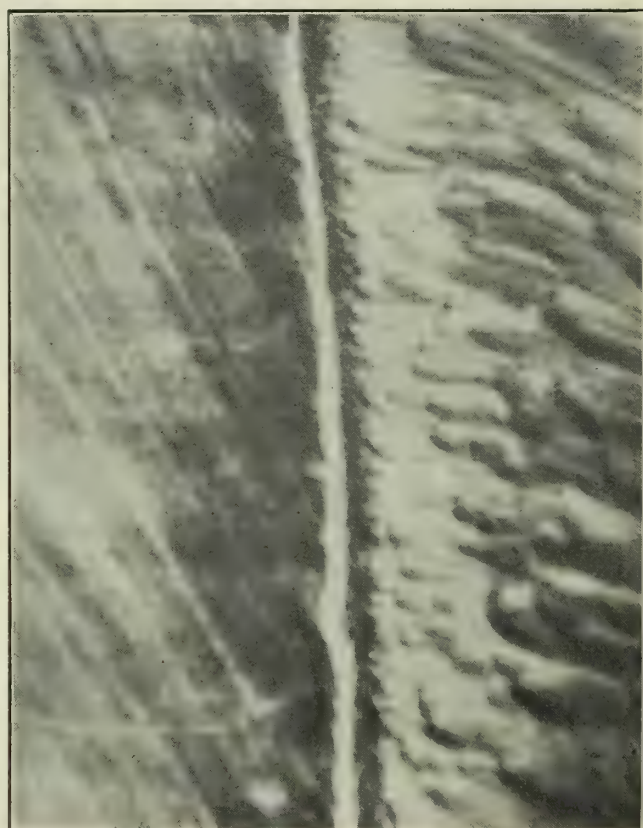
their gross chemical composition or of their resistance to mechanical stress, from which I was led to study the textural features of the teeth by means of the micropolariscope. By this method at least three important kinds of data are obtainable: first, the direction and intensity of what may be termed the impulses of calcification; second, the degree of calcification of the tissues meas-

degree of transparency is in direct relation to the proportion which the mineral constituent of each tissue bears to its organic constituent. Thus, under the polarized ray the degree of its transmission for the several tissues would be in the following order: enamel greatest, dentin next, and cementum least. We thus have at command a means for optically differentiating the calcified struc-

FIG. 3.

Enamel and dentin. Senile tooth. ($\times 110$.)

FIG. 4.



Same field and magnification as Fig. 3, as seen by polarized light.

ured in terms of the relation of calcium salts to organic matter in the tooth; and third, the mode of distribution of the calcium salts throughout the several tissues of the tooth.

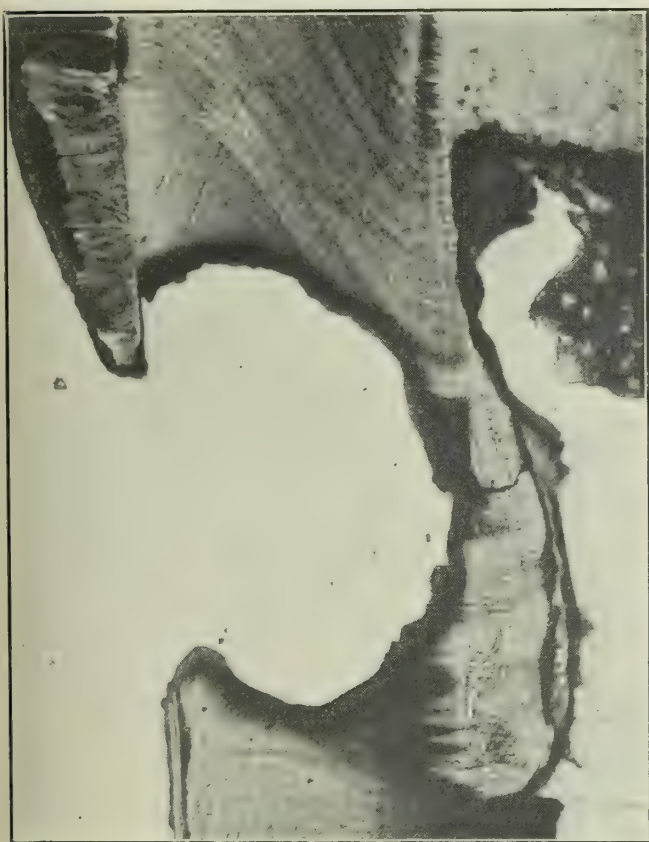
Examination of a ground tooth-section through the microscope by means of polarized light reveals at once a marked difference in appearance of the section as compared with that seen under ordinary conditions of illumination, in that the several component structures enamel, dentin, and cement show different degrees of transparency to the polarized ray; and what is of especial interest, *the*

tures of the tooth in relation to their respective proportions of mineral constituent, for it is the mineral constituent alone which is polarizable. But when we pursue the study farther we find not only that the relation of polariscopic transparency to percentage of lime salts holds good, but that the method is of such extreme delicacy as to enable us to detect the differences in distribution of lime salts in different parts of the same section. We are thus able to clearly make out irregularities of calcification, and further, to read the interesting record of physiological oscillations in

the intensity of the process of calcification due to variations in the nutritional state while the building of the hard tooth-structure was proceeding. We are able with the polariscope to see that the chemical structure of the tooth is by no means homogeneous,—that its aggregation of calcific elements is extremely varied, not only as relates to different teeth but in the structure of the same

means of the spectroscope, and since it is manifestly impossible to obtain a knowledge of the sun's composition by the methods of ordinary chemical analysis, so is it equally impossible to obtain a knowledge of the state of aggregation or the mode of distribution of the chemical compounds entering into the structure of the tooth by the methods of gravimetric chemical analysis. The applica-

FIG. 5.



Section showing carious cavity, secondary dentin, and pulp-nodules by ordinary transmitted illumination.

FIG. 6.



Same as Fig. 5. Showing greater transparency of highly calcified structures by polarized light.

tooth; and it seems to me to be a self-evident proposition that wide variations in the physical characteristics of tooth-structure must necessarily result from these demonstrable differences in the assemblage of its component elements.

In the examination of tooth-structure with the polariscope it must be borne in mind that we are dealing not only with its histology but with its chemical composition. The picture of a tooth-section presented by the micropolariscope is an optical record of its chemical composition in somewhat the same sense that we determine the composition of the sun by

tion of the micropolariscope to the study of this question is a further step toward a solution of the problem of the structural difference in teeth dependent upon their chemical composition and the manner in which their component elements are put together.

PULP-NODULES AND POLARIZATION.

Before proceeding to the demonstration of the structural features of the teeth which I have attempted to describe I wish to refer to the application of the micropolariscope to the study of calcic deposits in the pulp and pulp-chamber.

FIG. 7.



Pulp tissue and nodules in canal by ordinary light.

FIG. 8.



Same as Fig. 7. Showing brilliancy of pulp-stones by polarized light.

The law which I have enunciated that *the transparency of a calcified structure is in direct proportion to its degree of calcification* holds good for these pathological deposits in the pulp-chamber as well as for the normal hard tissues of the teeth and of bone. So delicate is the optical reaction of these pulp-deposits that they can be unerringly detected and differentiated by polarized light when they are so small or imperfect as to otherwise escape notice. The same means enables us to differentiate accurately between secondary dentin and those free denticles or nodules which have become attached to the parietes of the pulp-chamber and progressively included in the secondary dentin formation. The brilliancy of some of these aggregations of calcospherites has led me to suspect that they are nearly pure calcium phosphate and possibly some carbonate, with practically no organic matter,—thus while much softer yet nearly approaching enamel in chemical composition. This is merely an inference drawn from their optical properties based upon the law of transparency to polarized light, as already stated, but which inference I have as yet been unable to verify by chemical analysis.

It seems to me after close study of this problem for the past year that we have in this method of research a means for harmonizing the differences of opinion entertained with regard to variations in the textural characters of teeth. I am unable to see that the results in any degree conflict with the conclusions of Dr. Black already cited. I think, however, that they do go far toward explaining those differences in tooth-structure which have certainly been observed by the clinical operator, and which, though he may have heretofore failed to express them in terms of scientific exactitude, are nevertheless realities which experience and observation have indelibly impressed upon his consciousness.

NOTE.—The photographic reproductions which accompany this paper are designed to show the optical differences in the same specimen under ordinary illumination and by polarized light respectively; but they only imperfectly delineate the gradations of texture and irregularities of calcification which they are intended to illustrate. To obtain an adequate conception of the value of the polariscopic method in the study of calcification of the dental structures the actual specimens must be studied with the instrument.—E. C. K.

BRIDGE WORK AS A POSSIBLE FACTOR IN THE CURE OF PYORRHEA ALVEOLARIS.

By **W. V-B. AMES, D.D.S., Chicago, Ill.**

(Read before the New York Odontological Society at its monthly meeting, November 18, 1902.)

AS a beginning I wish to take to myself the usual latitude of referring for convenience to all conditions presenting desperately loose teeth as "pyorrhea alveolaris," and the privilege of qualifying the application of my remedial adjunct as I progress.

Among the causes to which looseness of teeth is attributable, malocclusion has been recognized as a considerable factor. Even with normal occlusion it has been found that in dentures presenting extra-

prominent cusps there is possible a wrenching of the tooth in its socket amounting in effect to malocclusion. The effect of this wrenching of a tooth in its socket is a traumatism, and, without going into particulars to any extent, can be considered sufficient cause for results.

It is but a step farther to recognize a feature which has not to my knowledge been taken cognizance of, *i.e.* traumatism of the peridental membrane from

excessive impact during mastication in dentures *not* presenting malocclusion, or even the extra-prominent cusps. For a few years I have been able to account for the looseness of a few teeth of a denture in which others were unaffected by the fact that the arrangement and occlusion was such that these teeth received more than their share of the work of mastication, which has explained to my satisfaction the waste of peridental tissue which ends in looseness and discomfort, age of patient and predisposition being sometimes contributing factors. The doctrine that teeth need exercise for the promotion of health in contiguous soft tissues is good in degree. The friction of food is salutary in keeping tooth-surfaces clean and in effecting a massage of the gums, and, with all conditions properly proportioned, is good for the peridental membrane; but to excessive impact, I am satisfied, can be attributed the destruction of the peridental membrane of many ill-conditioned teeth.

FIXATION OF LOOSE TEETH.

Recognized practice calls for the mechanical fixation in their sockets of two or more loose teeth by uniting them one to another by the means deemed by the operator most practical and efficient. This does nothing more than relieve an individual root of the entire excessive stress which may be brought upon its crown.

It is found that perfect mechanical fixation, along with indifferent scaling and therapeutic treatment, will do much toward bringing loose teeth into comfortable service; whereas the most thorough scaling and most approved therapeutic treatment with indifferent fixation means, according to my observation, the more or less early loss of affected teeth. If I have, however, been in touch with the teachings of the day, I was a transgressor a few years since, when I became imbued with the idea that certain loose teeth might be retained to advantage as piers in planning the construction of bridges,—the general practice being, according to my understanding, that such teeth should be removed

as a preliminary. I had seen very loose teeth extracted, smoothed off, replanted and rigidly fixed to neighbors with the result of becoming very firm in their sockets, and in other cases the same result attained without the thorough cleaning of root which is possible by extraction and replantation.

Having seen these results it was with all confidence of success that I began constructing large bridges in the mouths of patients who had for some years been putting off the evil day when they must lose a few remaining teeth and come to the wearing of full dentures because these few teeth were so lacking in peridental attachment that they were considered insufficient support for a bridge denture. I believed that each root when fixedly held in its socket would become sufficiently firm in its attachment to be a respectable pier for a bridge, and in this I was not disappointed. I was not, however, prepared for one feature of the outcome of these cases. During years previous to the building of the bridge there had been a constant battle with the tendency toward accumulation of sanguinary calculus, whereas on the appearance of the patient for the usual periodical scaling there was not only no calculus to be removed, but the old pockets were being obliterated.

Cases of five years' standing have not, since the insertion of the bridge, needed the removal of anything except the inevitable accumulation of soft salivary calculus,—and surprisingly small quantities of that, because the apparatus has been freely used for mastication.

THE CAUSE OF SANGUINARY CALCULUS.

These observations have convinced me that there has prevailed an erroneous idea as to the part played by sanguinary or serumal calculus in pyorrhea and looseness of teeth. I have become convinced that in the large majority of cases sanguinary or serumal calculus is the result of inflammation caused by the wrenching of the teeth in their sockets, instead of being the product of an inflammation dependent on some constitutional dyscrasia, and that in the small minority

of cases in which the constitutional dyscrasia exists the traumatism is earlier and more readily produced. In other words, because of the dyscrasia the traumatism is superinduced. In making this statement I must not overlook the traumatic lesions of the peridental tissue caused by foreign substances forced beneath the gum, and those from excessive wedging and malleting.

Since I have adopted the convenient but questionable plan of calling conditions presenting loose teeth "pyorrhea alveolaris," I want to say that I am also considering cases presenting desperately loose teeth with considerable loss and waste of peridental tissue, and not the occasional cases where a very acute condition exists resulting principally from an acute constitutional disturbance.

I trust it is sufficiently plain that in my advocacy of rather radical procedures I have not under consideration any cases of simple gingivitis so often termed pyorrhea alveolaris, or even those cases in which from long neglect of salivary deposits certain teeth have become somewhat loose but because of other favorable conditions are amenable to simple treatment.

The desperate condition we have under consideration is often the result of neglect of such deposits along with destruction of peridental tissue and alveolus from traumatisms. An observation of the fact that fewer cases of loss of incisor teeth are met with where there has been an end-to-end apposition than with a considerable overbite, and that teeth of the latter class already loose are usually equal to a severe end thrust without causing discomfort, suggests that a few such teeth may be made to do a reasonable amount of work if so braced laterally that they are relieved of all wrenching and subjected only to the end thrust, as in a large bridge. Cases innumerable are presented, and have been condemned to full dentures, in which a sufficient number of teeth or roots are present, along with well-seasoned alveolar ridges, to give the patient a satisfactory masticating apparatus after the few teeth have been properly bound to-

gether by the metallic framework of a bridge and further steadied in their sockets by *extension saddles*, if such happen to be called for. I have seen and heard it variously stated that nature rebels against this binding of teeth fixedly to one another; that the tactile sense of individual teeth ought not to be destroyed, etc. I have simply to say that I have not noticed this rebellion on the part of nature, and as to the tactile sense there is a superabundance of it in the cases under consideration when they present for treatment.

CONSTRUCTION OF EXTENSION SADDLES.

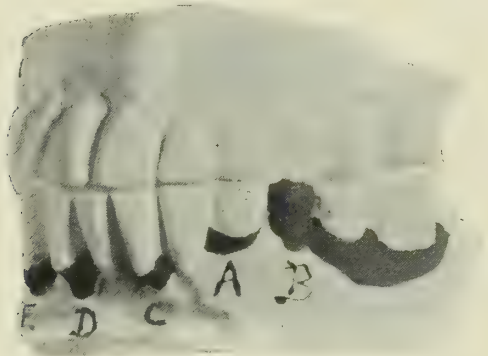
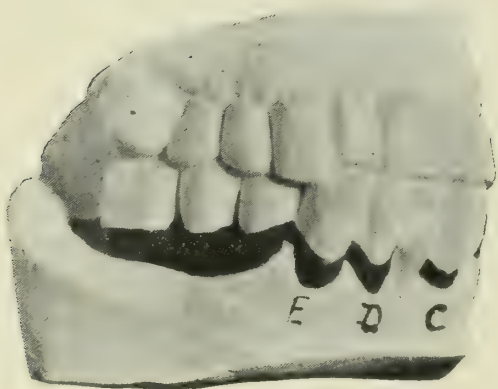
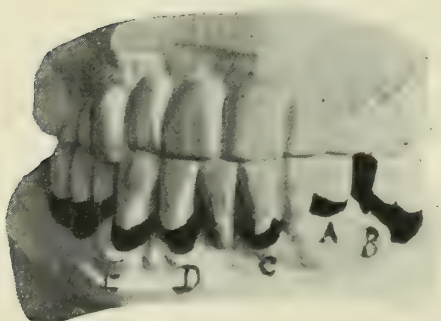
The question of the practicability of extension saddles will no doubt immediately come into the minds of many present, so, although this is of itself a sufficient subject for a paper, I will say that this adjunct having been of great service to some of my patients I will give a brief outline of the plan on which I believe such saddles should be made.

Given a well-seasoned alveolar ridge, as a general proposition the success of an extension saddle depends upon its having a sufficient length to preclude the yielding at its extreme free end exerting a serious wrenching effect upon the anchorages. It is easily evident that a saddle reaching from a canine as far posteriorly as the ridge will admit, this being generally a distance of an inch and a half, will carry masticating teeth upon half or three-fourths of its length more satisfactorily than would one less extensive. The short saddle is less stable simply because of covering a lesser extent of alveolar ridge, and thus being more liable to be depressed to a certain extent; but in addition such a one would, from its free end being too near the root attachments, keep up a disastrous movement of anchor teeth in their sockets; whereas the longer saddle, because of yielding less at its free end under stress, having better support, and being a longer lever, will not be the cause of a greater movement of anchor teeth in their sockets than is in keeping with the normal functions of peridental tissues.

LOWER BRIDGE SUPPORTED BY LOOSE ROOTS.

Referring to the typical lower bridge denture illustrated by Figs. 1 and 2: As stress is usually brought on such lower anterior teeth, supposing more or less overbite, an extension saddle such as is shown will prove very advantageous.

FIG. 1.

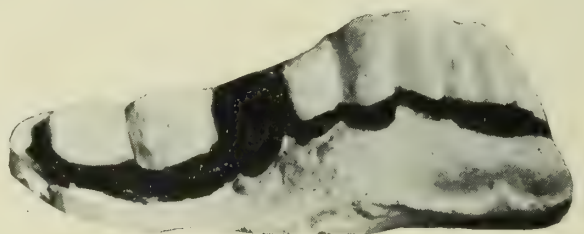
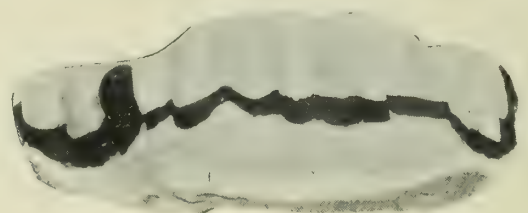
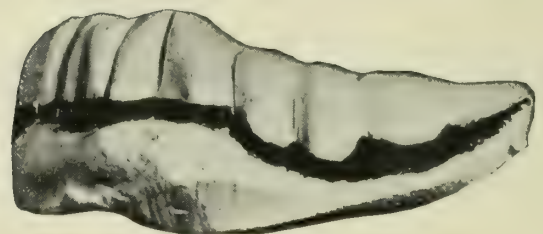
a*b**c*

Having thus considered extension saddles, I must say that the most successful ones that I have seen were adapted from pliable pure gold or platinum finally upon the alveolar ridge itself instead of being swaged entirely upon dies. By this means proper and accurate bearing is obtained. (Extension saddles constructed by assistants in

the laboratory from impressions taken by the operator are not under discussion.)

Fig. 1 shows a typical lower bridge denture of the class I am considering: A is the root of a tooth which had a good attachment in the alveolus; B was somewhat loose, and C, D, and E were very loose. This denture was put in position with some promise that it would defer the wearing of a plate for five years. The five years have elapsed and the den-

FIG. 2.

a*b**c*

ture is still eminently satisfactory, the loose teeth having soon acquired normal periodontal tissues. (By "normal" I wish to be understood to mean conducive to comfort.) If in such a case the remaining incisors and canines are of proper color and in proper alignment and are easily matched with porcelain where spaces exist, I obtain very satisfactory results by making use of the natural crowns for mounting upon the framework of a bridge, as is shown in Fig. 2. In this case the incisors and canines were present and also the bicuspids of one side, the incisors and bicuspids being

very loose. The plan adopted was described by me as a novelty in a paper read before the National Dental Association at Milwaukee, 1901, entitled "Splints for Loose Teeth," and was published, after a fashion, in the *Dental Digest* for December 1901, and in the society's Transactions. Inasmuch as that paper, read in August 1901, treated of cases and procedures so identical with those considered in a paper before your body on February 18, 1902, by Dr. D. D. Smith, entitled "An Original System of Tightening Loose Lower Incisors and Cuspids, etc.," and inasmuch as my paper was badly garbled in the publication, all illustrations and references to illustrations being eliminated, I feel warranted in quoting freely therefrom.

In the application of varied forms and modifications of such apparatus for mechanical fixation, I know that many men in various sections of this and other countries have simply met conditions as presented. The views of Dr. Smith on the advisability of pulp-devitalization in such cases are naturally concurred in by all gentlemen making use of the method.

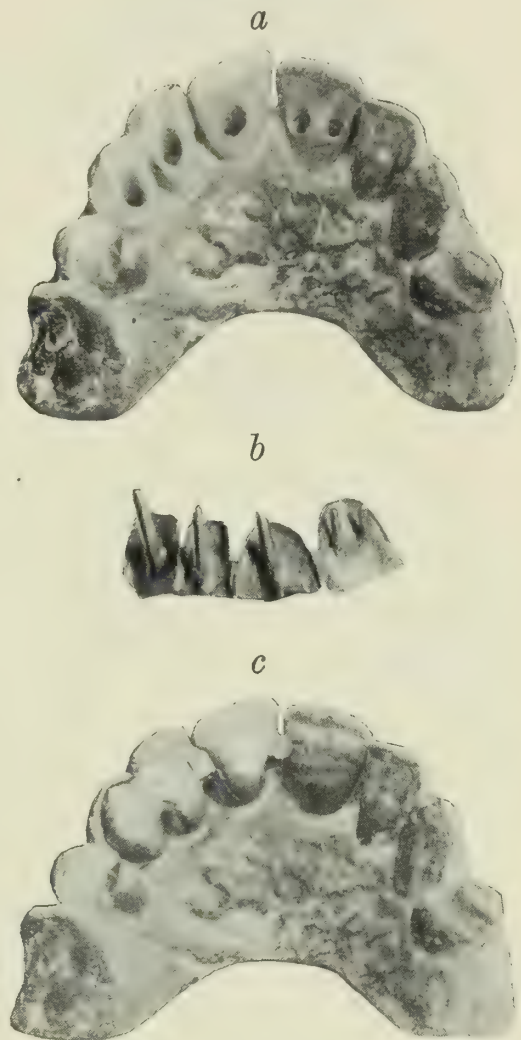
SPLINTING OF PYORRHEAL TEETH.

In my paper of August 1901 I said: "In pyorrheal cases in which a few or many teeth are loose without the complication of edentulous spaces, or even when an occasional tooth is missing, a very satisfactory splint can be constructed, after devitalizing as a general rule, by fitting plates to a surface of each tooth and a dowel to enter the pulp-canal, and assembling these by soldering. Such attachments can be made to carry a few dummies very satisfactorily, and the aggregation could be properly called a bridge." (See model Fig. 3, *a*, *b*, and *c*.)

"In making an appliance for any case in which there are teeth so loose that their retention calls for some radical procedure, I believe that the first consideration should be the devitalization of the pulps of the affected teeth. A loose tooth with a vital pulp is generally a source of neuralgia. Of the more or less firm teeth which are to be included

in the apparatus for stability, the pulp may often be left *in situ* with safety. A form of appliance which I have found serviceable is illustrated by a model of upper front teeth (Fig. 4, *a*, *b*, *c*) on which attachments to pulpless and vital teeth are shown."

FIG. 3.

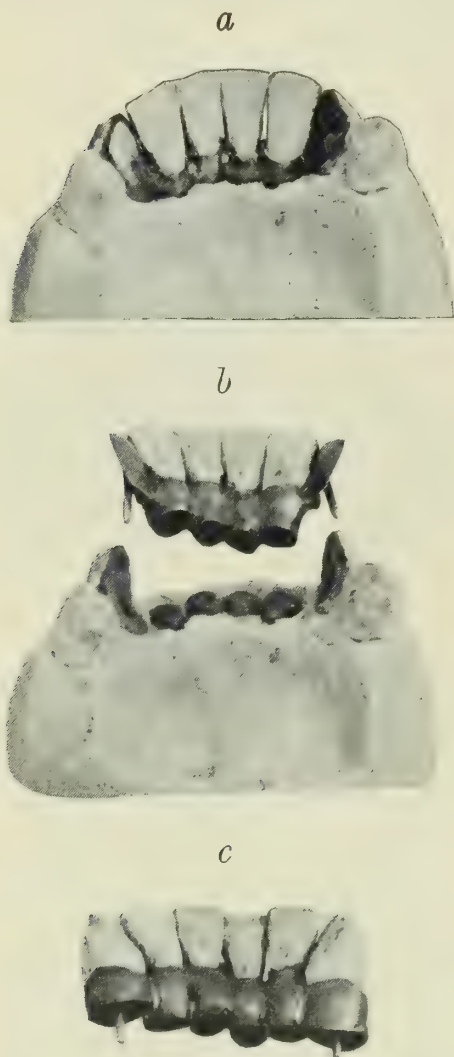


So much, at present, for apparatus of the form described by Dr. Smith. To quote further from my paper:

"I wish to describe in detail only one appliance, which I think is sufficiently novel to warrant a description. The construction of this depends upon the practicability of using natural tooth-crowns after they have been amputated from their roots, for mounting upon the metal framework of a bridge. This use of the natural tooth-crown I consider most often warranted when treating looseness of the six anterior lower teeth, as they are probably the most difficult to reproduce satisfactorily in porcelain, and as the occlusion usually comes upon them in such a way that they are a support

and brace to each other. Each is the keystone of an arch, while the reverse is usually the case in the anterior region of the upper jaw. Very often these lower

FIG. 4.



teeth are abraded and so stained that their reproduction in porcelain is difficult, and when they have occupied positions *not* in regular alignment a much more pleasing result can be obtained by remounting the natural crowns."

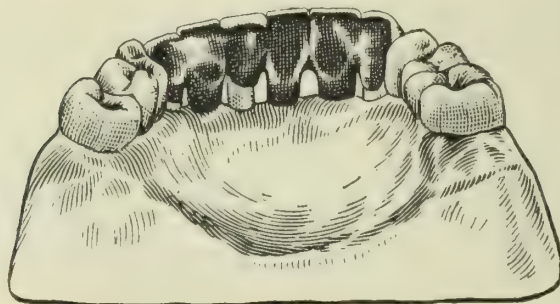
AMPUTATION OF THE CROWNS AND THEIR SUBSEQUENT MOUNTING UPON BRIDGES.

This was the plan of procedure with the incisors and canines of case represented by Fig. 2 and Fig. 4, the tooth-crowns being sufficiently intact to cause me to desire to utilize them in preference to any porcelain substitutes. It will be noticed that the teeth were overlapping, which arrangement could be carried out identically in the arrangement upon the splint denture. I am personally a great

admirer of human ivory and of more anatomically correct forms than those usually obtained in porcelain.

This may seem a very radical procedure because of the amputation of the crown, but, considering the greater strength of tooth-material remaining and the opportunity of better protecting the cut surfaces, I think that there can be no question as to the amputation being a more promising operation than the opening of the pulp-canal from the lingual surface, as in my experience in that operation it is generally desirable to remove a considerable portion of the enamel of the lingual aspect to accommodate the proper amount of gold for stability without making the apparatus clumsy. On one point in this connection there is to me no doubt, *i.e.* considering the patient's comfort in the *average* case, the band reaching well under the gum on the lingual surface of the root (Fig. 4) is immensely more satisfactory to the patient than the lower edge of the lingual plate (Fig. 3), or as is shown by Fig. 5, taken from the *Dental Digest* and which you may recognize.

FIG. 5.



In making appliances in my early practice, such as described by Dr. Smith, I found that unless the plate was carried well beneath the gum, the patient would experience serious annoyance from the tendency to fondle with the tongue the lower edge of the plate even when fitted as accurately as I think it would be apt to be fitted in the average case. As cases predominate there is an irregularity which it is desirable to reproduce, and also often an inclination of the teeth lingually, complicating the question of parallel lines. For these and other reasons, I have come to prefer the amputa-

tion to the lingual plate attachment upon the lower incisors in the majority of cases.

A combination of the two plans might be adopted to advantage, the amputation applying best to the centrals of a typical case of four loose lower incisors, and the lingual plate might be advisable for the laterals from which the gum has receded to a less extent. In this respect much must be regulated by the length of tooth-crowns and the extent of destruction of soft tissues. With extra-short crowns the lingual plate would certainly be indicated, or with teeth much abraded, resulting in an end-to-end bite, the appliance might be nothing more than a series of gold inlays with dowels in root-canals, these being assembled by soldering one to another.

GREAT STRENGTH OF LOWER INCISORS.

The strength of the lower incisor crown when kept intact has been a surprise to me in some cases where the crowns were small and were subjected to unusual strain. In one case in particular where there was what has come to be spoken of as a prognathous bite, the upper teeth had cut away about a third of the substance from the lingual aspect of the lower incisors before they became too loose to offer further resistance. After amputating these and mounting upon a splint—with some concern as to the outcome because of lack of bulk of tooth-crown—my surprise was great on having the patient report in the course of time with an incisor broken from the splint, but instead of the crown being fractured the No. 17 gauge iridio-platinum wire had been broken. The patient reported having bent the crown forward on biting into an olive. Being away from home he bent it back to place, but it had become weakened, and before his return the dowel had parted near the base. The piece was repaired and now promises well—with the patient avoiding such food as olive stones. This is the only accident I have experienced of this sort, and, since prognathous jaws do not abound in cases presenting loose incisors, it only serves to illustrate the

strength of an already weakened tooth-crown.

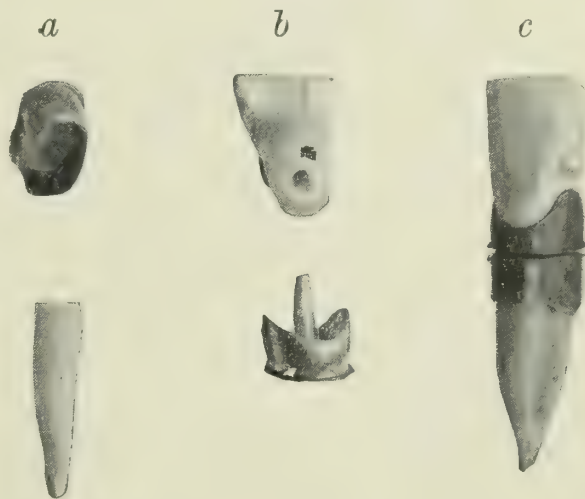
In the usual arrangement of teeth and form of bite each crown acts as a keystone, as has been suggested, which lessens the liability to such fracture as occurred with this prognathous jaw. After this experience, I shall have little hesitation in operating upon upper incisors in this manner, having previously avoided the application to uppers because of lack of the assistance of the keystone arrangement.

METHOD OF AMPUTATING AND MOUNTING NATURAL CROWNS.

If in a typical case of loose lower incisors amputation has been decided upon, the arsenical application—which I prefer for devitalization—is planted in a small pit made at a point on the tooth representing the line of intended division. At any time after twenty-four hours a spear drill can be passed through the center from labial to lingual surface, and with a small fissure bur the excision is made laterally from this perforation.

After shaping the root portion as for an ordinary case of banding for crown, take a measurement and proceed with fitting band and cope as if a porcelain face were to be backed up and mounted. (See Fig. 6, *a*.) The crown as it has

FIG. 6.



been amputated will need little preparation, the approximal surfaces needing paralleling slightly,—the measurement being taken of the smallest portion, the root end of the crown portion, and a band being cut of the width desired.

The fitting of this to the tooth-crown is very much facilitated by scalloping this band labially and lingually. By so doing the tooth-crown is easily forced into the band to the proper extent. By this scalloping of the band it is inconspicuous at the labial aspect and yet passes up on the tooth-crown sufficiently upon the approximal surface to give proper support. (Fig. 6, *b*.)

The pulp-canal of the crown has been enlarged to admit a wire of as large a size as is deemed desirable considering the size of the crown. I never use smaller than No. 17 nor larger than No. 15 iridio-platinum wire. The canal is enlarged to accurately admit the wire. The band and coping have been accurately fitted to the crown portion as they have been to the root portion. This dowel is very readily soldered, of course, to its coping. Before the amputation of this crown it is advisable to take a small modeling composition impression of the incisal edge of the tooth to be operated on, and one or two teeth on either side, so that after the band and cope have been fitted to the root and to the crown, and the dowel inserted, these two portions of the apparatus can be waxed together and carried to the mouth, and, while the wax is somewhat warm and soft, by means of this little impression fitted to the incisal edge of that tooth and some of its neighbors it can be brought to the original position, supposing of course the original position is to be duplicated. (See Fig. 6, *c*.)

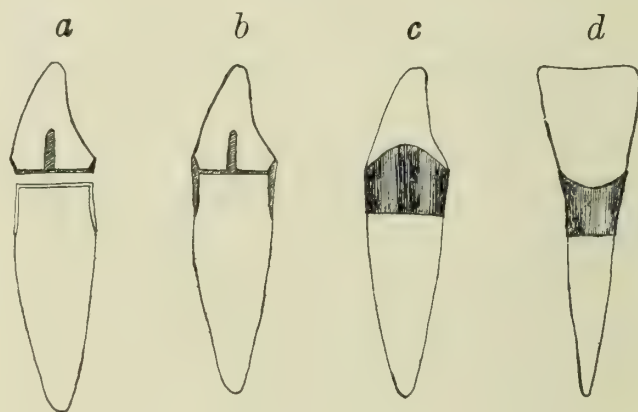
After getting the accurate position of the tooth-crown, the next procedure is to lay aside the natural tooth-crown (and as an extra precaution always place it in water when not operating upon it) investing in the relation shown and uniting them with solder.

Fig. 7, *a*, shows the attachment to the tooth-crown and to the root; *b* shows them soldered together; *c* shows the approximal, and *d* the labial aspect.

After these details have been carried out with all the teeth which it is intended to include in the appliance, they are placed upon their roots and a plaster impression taken,—the crowns put aside

and the parts assembled by soldering as in the ordinary process of construction of bridges, the individual parts being strengthened at this time, or having been strengthened separately before assembling. Before cementing the tooth-crowns into their sockets I find it an ad-

FIG. 7.



vantage to drill a small canal from a point on one approximal surface which will be just covered by the band to the enlarged pulp-canal of the crown, this to be a vent to facilitate the cementing process. After cementing all tooth-crowns into their pockets with oxyphosphate or gutta-percha, and finishing, you have a bridge which in its final setting does not differ from any other, except in the looseness of the roots, which necessitates the use of a cement which sets satisfactorily from a thin consistence. If there be no chance of needing to remove the appliance at a future time, a cement such as I speak of, that will acquire its maximum hardness from a thin consistence, such as oxyphosphate of copper, can be used to advantage for cementing the appliance upon the roots. If any question arises as to the desirability of removing the appliance and making any additions or alterations or repairs, then I would certainly advise fixing the crowns upon the splint with gutta-percha, and if at all practicable the splint to the roots as well. I have used the low heat and moderate heat gutta-perchas for attaching the tooth-crowns to the splint, because the metal portion of this splint can be made sufficiently warm to easily force such tooth-crowns accurately to position on the splint. When it comes to setting the

appliance on the roots in the mouth, on account of the looseness of some of the roots, if it is desirable to use gutta-percha as a safeguard, I have sometimes found satisfaction from using a solution of gutta-percha dissolved in nine parts of chloroform to one of such an agent as oil of eucalyptus, cajuput, or myrtol,—taking a portion of this solution made as thick as possible upon a slab, just as so much cement, and spatulating it until the chloroform has largely evaporated, giving one a rather stiff, rigid gutta-percha. It is found that while the chloroform has evaporated, the essential oil has not. With this trace of the essential oil left in the gutta-percha a very slight heat will so soften the gutta-percha that the appliance can be pressed to place with an excess of the gutta-percha the same as with an excess of thin cement. In a few days the essential oil seems to leave the mass and it becomes quite firm—sufficiently so, I have found, for all purposes if all parts are made to fit so accurately that there is a mere film of the gutta-percha present. In the ordinary cases of crown-setting, where there are apt to be considerable spaces, I should not expect the same result in attaching as in these cases, where there is the minimum space between the dowel and its receptacle and the crown and the sides of the root, and the ends of the crown and the ends of the root.

Of course I am aware that natural tooth-crowns have been employed upon plates with not altogether satisfactory results, but I am sure this was a matter of environment or quality of crown. In the process here advocated the crowns have stood for many years in the identical environment; the cut surfaces are effectually protected, and the strength of the crown as mounted has been demonstrated to my satisfaction.

DESPERATE PYORRHEAL CASES.

The desperate cases I speak of are those where the patients are going about with incisors ligated in place, and upon the removal of the ligatures possibly one or two teeth come away as foreign bodies. I have operated upon a number of these

cases, and with the foreign teeth I have simply taken them to the bench, amputated them with a saw, fitted the roots to the crowns just as the teeth in the mouth, and when the apparatus was finished and ready to be set, the roots of the teeth which were entirely foreign bodies I simply cemented into their particular receptacles in the splint; and as the bridge was set, these roots merely went down into their sockets, which were kept open in the meantime.

I will pass models illustrating three cases in which teeth were foreign, *i.e.* entirely detached, and were operated upon at the laboratory bench instead of in the mouth. The models will show the apparent condition of the gums. In a few months after the insertion of such roots it is impossible to pass fine exploring instruments between the roots and the tissues, there being apparently some sort of attachment. In making these operations I have not cared whether there would be an attachment or not. I have returned the roots to their sockets for the advantage which I should get from the natural contour and giving the patient no change of condition in that part of the mouth. I have been surprised to find that about these roots which had been made perfectly smooth the gum is ultra-healthy, I might say. While the gums are healthy about the other roots this seems almost cartilaginous, and there is apparently some sort of attachment. I do not expect a bony attachment, but there must be connective tissue or scar tissue, or something of the sort. Whether it will turn out that these roots are being destroyed by the osteoclasts or not, the conditions are extremely satisfactory, and if the teeth last a few years—five or ten, or longer—I shall consider that the return of those roots to the sockets is justified.

In closing, I simply wish to say that traumatism from excessive stress I think ought to be considered a considerable factor in the etiology of pyorrhea or looseness of teeth, and bridge work a factor in the amelioration of pyorrhea and looseness of teeth which we cannot afford to overlook.

THE "A B C" OF CROWN AND BRIDGE WORK.

By FRED. A. PEESO, D.D.S., Philadelphia, Pa.

(Continued from page 279.)

DEVITALIZATION OF THE PULP.

WHEN from any cause it is found necessary to devitalize the pulp of a tooth, there are several questions to be considered. The first of these is, In what way can it be done with the least pain to the patient? Second, In which of the methods employed is there least danger of irritation or injury to the adjacent parts? Third, In what way can it be most quickly and easily accomplished?

There are several methods and agents employed for the devitalization of the pulp, and almost any of them may be indicated under certain conditions.

Among the agents most generally employed for this purpose, arsenic easily heads the list. It is the one, too, which is the most dangerous in the hands of an unskilled or careless operator. It is better never to use arsenic if it can possibly be avoided, as there is always danger of local disturbances, such as arsenical pericementitis or necrosis, following its use. This trouble may not manifest itself immediately, but sooner or later it may appear in a mild or aggravated form. If the arsenical application be not perfectly sealed in, especially when the cavity extends below the gingival margin, necrosis is likely to ensue from leakage of the preparation and contact with the soft tissues, which in some cases might result seriously. Some subjects are peculiarly susceptible to this poison, and, in the mouths of such, arsenic applied for a few hours only would be sufficient to completely devitalize the pulp, while in others it might remain in a tooth for days or even weeks with seemingly no effect. In the former case, if it were left in the tooth for any great length of time the chances are that its action would not be limited to the pulp itself,

but would extend through the foramen and beyond the apex, and involve the surrounding tissues. Especially would this be true if the foramen were somewhat enlarged. The danger is greater when using it upon a young than upon an elderly subject, as the root may not be fully developed, and in these cases carbolic acid or creasote would be indicated. Then, too, there are instances where there are imperfections in the walls of the root-canals.

An interesting case of this character came to the clinic of one of the dental schools several years ago. The patient was a middle-aged woman and the tooth a lower left first molar, with a large cavity on the mesial side, the pulp being freely exposed. The rubber dam was placed on the tooth and an application of arsenic and iodoform made, using oil of cloves as a vehicle, and the whole was sealed in with gutta-percha. The next day or the second one following, the application was removed and a dressing of carbolic acid put in its place and sealed, as before, with gutta-percha. This was allowed to remain *in situ* for several days and when the patient returned it was found that the gum was blanched and there had been considerable sloughing on the lingual side of the molars and bicuspid. A sequestrum of the process was removed so large as to partially denude the roots of the two bicuspid and first and second molars. It was then found that the distal root was imperfect, there being a hole as large as the head of a pin on the lingual side, more than one-eighth of an inch below the gum line and below the process, through which the action of the arsenic had extended so as to involve four teeth and a part of the fifth.

It was impossible that this opening

could have been made with a drill or other instrument, as the distal part of the crown was sound and the perforation so far below the pulp-chamber that it could not be reached until the opening from the cavity had been considerably enlarged toward the center of the tooth. Even had it been accessible from a cavity, it would have been necessary to have drilled through the body of the pulp and for some distance into the canal in order to reach the opening, which of course would have been impossible with a live and healthy pulp.

A condition of this kind is, fortunately, very rare, as it is one which it is impossible to foresee, and if arsenic be used in such a case there is no escape from trouble which may result in serious injury to the patient. In almost all cases where arsenic is employed, something else can be used which will do the work as well, or better, and without any danger of ill results following its use. When arsenic is used, if it be applied directly to the pulp it should be left *in situ* for but a few hours. If on opening the tooth again it be found that it has not taken effect, another application can be made, and repeated if it be found necessary to do so. The action of the arsenic should not be carried all the way to the apex, but it should be watched carefully, so that the pulp can be removed while there is still some evidence of vitality at its apical extremity.

If there be no exposure, it is safer to make the application only a little below the enamel, or in the bottom of an existing cavity, just deep enough so that it can be properly sealed in. It will act through the dentin, so that in a few hours that tissue will be sufficiently obtunded to enable the operator to expose the pulp without pain to the patient, after which, if he so desire, he can anesthetize and remove the pulp in the manner which will be described.

One thing should always be remembered, and that is that arsenic or local anesthetics will not act on an inflamed or congested pulp. If the pulp be in that condition, a dressing of oil of cloves and morphin sulfate is one of the best

remedies for reducing the congestion. A pellet of cotton saturated with oil of cloves, with from one-fortieth to one-thirtieth of a grain of morphin sulfate added to it, is placed in the cavity and allowed to remain until the condition of the pulp is normal, which will usually be in from twenty-four to forty-eight hours, after which the arsenic can be applied.

In devitalizing with arsenic it has been the experience of the writer that there will be no pain, except in very rare instances, if it be used as advised by Dr. James Truman: A very small quantity of arsenous acid is mixed with iodoform and oil of cloves, or carbolic acid, and applied on a small pellet of cotton. This is covered with a small cap of tin or aluminum, to prevent any pressure on the pulp, and the cavity is sealed with gutta-percha or cement. It sometimes happens that the pulp will resist the action of the arsenic and repeated applications will be without effect. When this is the case, some other agent will have to be employed.

Cobalt is also used as a devitalizing agent. The active principle is arsenic, but in combination with sulfur, and therefore less irritative than arsenous acid. It may be left in the tooth much longer than arsenic, and it is claimed that in time the pulp will entirely disappear. This may be true, but as the writer has had no experience with this preparation he cannot speak from personal observation. It is questionable whether it is safe to leave any arsenical compound in a tooth for any great length of time.

IMMEDIATE PULP-EXTIRPATION.

By far the safest and speediest method is immediate extirpation, either by anesthetizing and then removing the pulp at once, or by driving it out with a pointed orange-wood stick. In employing the first of these methods, the following are the details of the operation:

The rubber dam should always be used whenever it is possible to do so. If this cannot be done, napkins may be substituted, so as to keep the fluids of the

mouth from coming in contact with the tooth to be operated upon. If there be a cavity through which the canals are accessible, it should be utilized. The instruments to be used should be ready at hand so that they may be grasped instantly as soon as they are needed. They should consist of broaches for removing the pulp from the canals, a fair-sized spear-pointed drill, large coarse rose burs, a large cross-cut fissure bur and one or two large spoon excavators. The decay should be removed from the cavity, and if there be an exposure of the pulp a crystal of cocain hydrochlorid is placed immediately over it and a small pellet of cotton, not much larger than a pin-head, is saturated with alcohol and is placed over the cocain. A piece of unvulcanized rubber, large enough to nearly fill it, is then placed in the cavity, and with a burnisher or other instrument which nearly fills the opening it is pressed tightly in. The pressure may be quick and sharp or slow and gradual, and should be kept up for nearly a minute. When it is the former, the pain is sharp, but lasts for an instant only; but in the latter, while it is not so severe, it may last for several seconds.

Chloroform may be substituted for the local anesthetic, but if much of it be used it will dissolve the rubber. Chloroform and carbolic acid used with pressure is very effective. If the canals are freely exposed the anesthetic can be injected directly into the pulp with a hypodermic syringe, but this is a much more painful operation for the patient to undergo and possesses no advantage over the other methods. A solution of cocain alone will do the work, but does not seem to be so effective as when used in conjunction with some other drug. A solution of formalin one part and alcohol five parts acts well in conjunction with the cocain.

After the pulp is completely anesthetized and the rubber and cotton have been removed, the pulp-chamber should be well opened with the rose or fissure bur, in order to obtain free access to all the canals. The body of the pulp can be cut away with a coarse bur or a spoon exca-

vator, after which the pulps in the canals can be removed with broaches.

If it be a sound tooth that is to be devitalized, it is necessary to make an opening into it, so as to get a slight exposure of the pulp. This exposure need be no larger than the point of a needle. The tooth should first be isolated with the rubber dam. In any of the six anterior teeth this opening should be made on the palatal or lingual side, just above the basilar ridge and on a line with the pulp-canal. The enamel at this point is very thick and hard, and can first be broken through with a very small corundum or carborundum point or with a cross-cut inverted cone bur. A diamond drill, if the operator possesses one, will do the work more quickly.

The bicusps and molars should be opened through the sulci, on a line with the center of the tooth.

After breaking through the enamel, a spear-pointed drill can be used to open into the pulp. With the engine running rapidly and the drill very sharp, the exposure can often be made quickly and with very little discomfort to the patient, but when the tooth is very sensitive, it can be obtunded with ethyl chlorid spray. The spray should be applied intermittently, at first touching the tooth but for an instant only, then at momentary intervals, each time keeping it for a little longer on the tooth, until it is chilled into insensibility. In this way the tooth is cooled gradually, and there is not the pain or shock that occurs when the spray is applied directly and continuously. The spear-pointed drill is now used, and should sensibility return before the pulp is reached the spraying should be repeated.

The local anesthetic with pressure can also be used as an obtundent in making the exposure. As soon as the patient experiences pain it can be applied in the manner described, and this will enable the operator to drill a little farther, when the application can be repeated until the exposure is obtained. This may take a little longer, but there will be very little pain.

After the exposure has been made, the

opening through the enamel and into the dentin can be enlarged nearly to the pulp, to make room for the application of the anesthetic. This may be done with very large cross-cut fissure burs, after which the pulp can be anesthetized and removed as already described.

In using the anesthetic with pressure the pulp is not devitalized thereby, but simply anesthetized for the time being, and sensibility may return. In some of the multi-rooted teeth where difficulty is experienced in getting access to the canals, sensation may have returned to the pulp in one or two of them while the pulp was being removed from the others, and this would necessitate a second application; generally, however, only one is needed.

The mesial roots of the lower molars are frequently very difficult to open, there being often practically two very constricted canals, a buccal and a lingual, which diverge as they open from the pulp-chamber, but unite at or near the apex. It is sometimes impossible to open both of these, but every effort should be made to get at least one of them clear all the way to the end of the root. They should be cleansed as thoroughly as possible, and if one of the canals be well opened to the apex and the foramen perfectly closed, the pulp remaining in the other canal is entirely cut off and sealed both at the top and bottom, and there is little danger of future disturbances. Before filling, the roots should be wiped out with zinc chlorid to coagulate anything remaining in the tubuli.

The buccal canals of the upper molars are also frequently so small that it is very hard to get an instrument into them. These constricted canals can best be cleansed and enlarged with fine three-sided twisted broaches. A drop of sulfuric acid introduced into the entrance of the canals will very often materially assist the operator in opening and enlarging them.

In teeth in which the root near its end takes a sudden turn, almost or even quite at right angles to the rest of the root, it is impossible to remove all of the pulp, and the dentist must take away as much

as possible and trust the rest to Providence. In cases of this character the root should not be filled immediately, but a dressing should be placed in the tooth and left for a few days. Iodoform or aristol in combination with one of the essential oils, as oil of cinnamon, or preferably oil of eucalyptus, forms an excellent dressing for these cases, and will have a tendency to mummify the little remaining pulp and render it innocuous.

If there be much bleeding, it can best be stopped with adrenalin chlorid.

In undertaking to remove the pulp, the dentist should understand well the anatomy of the teeth. He should know the number of roots which each tooth, when normal, should possess, and just where to look for the entrance to the canals from the pulp-chamber. Frequently some of them are very minute and hard to find, and a knowledge of the normal position is very necessary.

Occasionally there is an abnormal condition and there may be a greater or less number of roots than there should be. The pulp-chamber should be well opened and the floor and sides be carefully examined with a fine explorer for every opening. The third molars, especially, are uncertain as to the number of roots, and the canals are frequently so small and tortuous as to render it impossible to open them for more than a short distance, and these the operator must treat to the best of his ability. The canals should be treated with zinc chlorid and a dressing placed in the tooth for a few days, after which it can be filled.

The upper first and second molars are sometimes found with but two roots. Where but two canals can be found, if the buccal one be very small it is pretty certain that another exists, and a more careful search should be made for it. When an upper first or second molar has but two roots the buccal canal will be found to be as large, or even larger, than the palatal, and if this be not the case, the dentist should not give up until the third be found. Very rarely, an upper first or second molar may have but one root. The canal will then be very large and cone-shaped. Its entrance from the

pulp-chamber will be nearly in the center of the tooth, with the floor sloping toward it from the sides.

A very interesting case of a single-rooted upper left second molar came under observation nearly a year ago. The patient was a gentleman of about thirty years of age. A bridge was to be placed in the upper left side of the mouth, with the canine and second molar as supporting abutments. The tooth was opened from the masticating surface and the pulp was anesthetized and removed in the manner already described. The apical foramen was found to be very much enlarged, and through it a broach was passed to its full length without meeting any resistance. A little piece of rubber dam was slipped on a long, slender probe, which was then passed through the foramen to a depth of two and one-eighth inches from the cusp of the tooth before encountering any obstruction or the patient feeling it. A hooked broach was passed through the foramen and over the end of the root, which was found to be of normal length, the tissues on either side of the apex being sensitive to its touch. Of course the natural supposition was that it passed through into the antrum, but on trying to force air through under strong pressure with a syringe it was found to be completely closed, and no effort could discover an outlet. Neither did the patient feel the slightest pain or inconvenience from the pressure. A dressing of eucalyptus oil and aristol was placed in the canal and left for a few days, when the root was filled. A bridge was then made and cemented in place and the patient has experienced no inconvenience up to the present time. A bridge was in the opposite side of the mouth from the canine to the first molar, which was found to be in normal condition.

"HEROIC" METHOD OF PULP-EXTIRPATION.

Very rarely it happens that the pulp will not respond to the application of the local anesthetic and pressure, and when this is the case, other methods will have to be employed, preferably the "heroic"

method. The pulp should be well exposed and driven out with an orange-wood stick. This should be whittled to about the size and shape which the canal of a given tooth is known to be, bringing it down to a sharp point, and laid within convenient reach, together with a small loaded mallet. If the crown of the tooth is to be removed, it can be cut nearly through with a thin disk or a fine cross-cut fissure bur, or holes may be drilled close together across the tooth with a small spear-pointed drill and then excised or broken off with the fingers. If the tooth be sensitive, it can be sprayed with ethyl chlorid. Excising forceps should never be used, unless the tooth has been cut partly through; if this has not been done there is an excellent chance of fracturing the root so as to ruin it. If there be not sufficient exposure, it can be enlarged with a bud-shaped bur or a spear-pointed drill by using the spray. The point of the orange-wood stick is then dipped in carbolic acid and placed in the opening, and a quick, sharp blow given it with the mallet. If it has been properly shaped the pulp will be forced out of the canal alongside of the stick. If it be not, it can be removed with a broach. The canal is then cleansed, sterilized, and filled. This method is especially applicable to the single-rooted teeth, but can be successfully applied to the first bicuspid, and even to the molars under favorable conditions, where the crowns are badly broken down so as to render the canals accessible.

This operation has been frequently characterized by some operators as being barbarous, but it is by no means so. If properly performed it comes as near being painless as any method of devitalization. It is done so quickly that the pulp is paralyzed by the shock, and the pain is no more than that experienced from a slight prick of a pin. It all depends on the manner in which it is done; in the hands of a bungling operator it might cause the patient a great deal of pain. In the upper molars, if the body of the pulp has been removed, that in the palatal canal can almost always be easily gotten out in this way, but the buccal

canals are generally too small and difficult of access.

In the lower molars the pulp in the distal canal will come away, but in the mesial there would be the same trouble as with the buccal canals of the uppers.

Some operators have advised the extirpation of the pulp in this way and the filling of the apex at the same time. The operation is performed as follows: The orange-wood stick is whittled down to a fine point, and at a distance of from one-eighth to three-sixteenths of an inch from the end it is cut around and nearly through. The pulp is freely exposed, then the orange-wood point is dipped in carbolic acid and driven quickly into the canal, so as to wedge the end tightly in the apex of the root. The stick is then twisted to break it off where it has been cut nearly through, leaving the apex filled with the orange-wood.

The writer would not recommend this method, on account of its uncertainty and

danger. In the first place, as the wood is pervious to moisture it does not make a suitable filling for a root, unless it be first saturated with a solution of gutta-percha, or gutta-percha or zinc oxychlorid be first introduced into the canal, which would be impossible in the operation described. Again, if the foramen should be enlarged the point might be driven through and broken off beyond the apex, where it would act as an irritant and probably eventuate in alveolar abscess. Another objection to this method is the uncertainty of the point reaching the extreme apex, if the canals be very small or tortuous, in which case the whole of the pulp would not be removed, and that remaining beyond the filling might cause the patient a great deal of suffering by becoming putrescent, and this might result in abscess. If the canals were tortuous it would be impossible to remove the filling for treatment.

(To be continued.)

SPLINTING LOOSENED TEETH IN PYORRHEA ALVEOLARIS.

By M. L. RHEIN, M.D., D.D.S., New York City.

(Read before the New York Odontological Society, at its annual meeting, January 20, 1903.)

THE splinting of loosened teeth, either for a short period or as a permanent operation, has become during the past ten years a recognized operation in the treatment of pyorrhea alveolaris.

Fifteen years ago at the annual meeting of the First District Dental Society, I had the honor of presenting to that society a patient having eight lower teeth firmly united together by means of a platino-iridium wire, held in position on their occlusal surfaces by gold fillings. The case is reported in the *DENTAL COSMOS* for March 1888.

The report of this case has unquestionably been the inspiration for considerable development in the saving of loosened teeth. In this case the pulps were left undisturbed. Nevertheless, the teeth, whose immediate loss had previously appeared to be a certainty, were

preserved intact for nearly seven years and some of them for over ten years.

Our present knowledge of the local pathology of such conditions brings with it the firm conclusion that had the pulps of these teeth been removed, the operation would have remained a success to the present day. Unfortunately, however, at that time we had not cast aside the slavish shackles which bound us fast to the creed which upheld the sacredness of the life of the pulps in adult teeth.

ADVANTAGE IN SPLINTING PYORRHEAL TEETH.

The advantage of holding these very loose teeth firmly together, consists in allowing new embryonal tissue to become adherent and attached which otherwise would be lost almost as soon as it was formed on account of the wild

movements of such loosened teeth. With some little knowledge of the historical data of this subject, I believe that our present inspiration for holding loose teeth immovable by means of various forms of splints is due primarily to that great teacher of American dentistry, the late lamented and endeared Dr. Wm. H. Atkinson.

Many methods have been employed for splinting by different men during the past ten years. The desire to perform the operation as speedily as possible has brought into use many crude splints, such as cementing a series of soldered bands or rings around the teeth. This is perhaps the most unhygienic form of splinting that has been devised, and cannot be too strongly condemned on account of its filth-carrying properties. All the splints that as a final operation are cemented into place have more or less objectionable features. These consist primarily in an exposure of their cement surfaces and in the fact that it is almost impossible to have the splint on an even surface with the enamel surfaces of the teeth.

Whenever it is deemed advisable to unite teeth firmly and permanently together, either for the sole purpose of supporting loosened teeth or in addition the carrying of a denture for the replacement of some lost tooth, the most skillful kind of work is demanded. If the work is to be of a really permanent character the pulps of all diseased teeth should at once be removed.

SPLINTING POSTERIOR TEETH.

In the posterior teeth where they are concealed from view, the appearance of gold is not forbidden. Especially if the molars are broken down, and some tooth missing, it becomes an easy matter to remove the pulps, grind down the teeth, and place in position the ordinary gold bridge cemented upon two abutments. With the anterior teeth we are confronted by a more serious problem. In these cases it is primarily essential to preserve the natural appearance of the teeth and see that they are not marred by any unsightly appliance; and sec-

ondly it is necessary to obtain sufficient strength to make, if possible, a permanent operation. To accomplish this the greatest ingenuity and skill is demanded.

A general plan of splinting such anterior teeth can be derived from the models hastily prepared by my assistant. This one (Fig. 1) illustrates the replace-

FIG. 1.



ment of a missing upper lateral incisor, where the central incisor has become loosened through periodontal disease. The next specimen (Fig. 2) shows the manner

FIG. 2.



of fitting a permanent splint to loosened lower teeth. The pulps have been removed and a staple of triangular-shaped platino-iridium wire with three parallel pins fitted into the three individual root-canals is seen lying in position. The next model (Fig. 3) shows the same

FIG. 3.



method applied to two upper bicusps and a molar, in which the pulp in the molar is not removed.

Returning to the first model we will endeavor to make clear the detailed steps

of such an operation. The illustration used to depict the technique is supposed to show the palatal surfaces of the upper left central incisor (loosened from disease) and the canine with the lateral missing. The pulps of both of these teeth have been removed, and the ends of the roots sealed with chloro-percha covered by a thin film of zinc oxyphosphate. A broad groove or slot is now cut into the palatal surfaces of these teeth from the entrances of the pulp-canals to the approximal surfaces as shown in Fig. 4. At the same time a piece of

FIG. 4.



triangular-shaped platino-iridium wire is bent into the shape of a staple as shown in Fig. 5, with the parallel ends fitted into the root-canals of the two respective teeth.

After this has been accurately fitted so that the base of the triangular wire

FIG. 5.

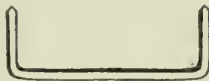
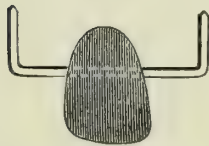


FIG. 6.



rests snugly in the bottom of the groove, a backing is attached to the horizontal bar in which to carry the artificial tooth. (See Fig. 6.) This backing is of the character generally advertised as the Mason, in order that the porcelain facing can be cemented into place after every other operative measure has been completed. The next step in the operation consists in lining the groove and the circumference of the outer plane of the pulp-canal's orifice with a thin gold filling, as shown in Fig. 7. This must leave the entrance to the canals open for the admission of the ends of the staple.

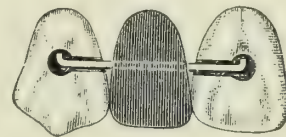
This is very easily accomplished by filling the canal with a cone of bibulous paper not quite to the entrance. Over this is run a thin film of cement, and while this is still soft, gold is gently

FIG. 7.



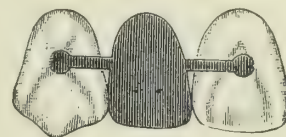
patted into the cement, and a few minutes later gold foil is malleted over the entire inner surface of the slot and around the orifice of the pulp-canal. With a fissure-shaped bur the entrance to the paper cone in the canal is easily made and the paper withdrawn, leaving the canal open for the admission of the pin, as shown in Fig. 7, copied from the natural tooth which has been prepared in this manner. The next step is to fill both canals with zinc oxyphosphate, of just sufficient amount to avoid any excess; and the splint is then cemented into its proper position. (See Fig. 8.)

FIG. 8.



After the cement has sufficiently hardened, the gold filling which lines the groove in which the staple lies is continued and brought up over the sides of the wire, which is ultimately completely covered by the gold filling, as shown in Fig. 9. When this is properly finished

FIG. 9.

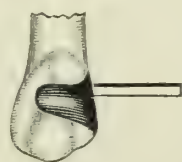


with plug-finishing burs and fine cuttlefish disks, there is no edge nor unevenness present. This is perhaps more readily seen in this specimen of a natural upper canine; it shows the completion of such a filling and the triangular-shaped wire protruding from the approximal side of the canine. (See Fig.

10.) The remaining portion of the staple has been cut off. No other method will give so smooth and finished a surface. The porcelain facing which has been previously ground to fit is now cemented in the backing and the operation is completed.

All sorts of variations of this method can be employed, depending upon the

FIG. 10.



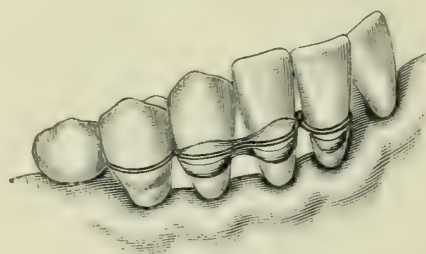
character of the case. The great advantage claimed for this especial technique consists in the perfectly smooth and polished surface, only attainable by means of a gold filling.

Where only a splint of a temporary character is desired, ligatures are very much preferred. The great objection to them has always been that they were filth-carriers. The celluloid cement that was introduced to us from Russia at the last International Dental Congress can be used in these cases to great advantage, by covering the ligatures with the cement. For this purpose a fine wire, of about No. 30 gauge, made of pure silver has given satisfaction. In

certain cases where there has been considerable loss of gum tissue and it is advisable to tie the ligature close to the necks of the teeth, it has been found that sometimes the ligatures will move upward toward the gums even though the ligatures are covered with celluloid. It has been discovered that this objection can be overcome by cementing small buttons of Harvard oxyphosphate of zinc cement upon the necks of the teeth immediately above the point of placement of the ligatures.

This model (Fig. 11) holds four natural lower teeth with the roots supposed

FIG. 11.



to be partly exposed. It shows this manner of wiring covered by the celluloid cement applied so that the model can show the wire covered and uncovered. It also exhibits the little buttons of zinc oxyphosphate cemented upon the necks of the teeth to prevent any displacement of the silver ligatures.

EXPERIENCE OF A COUNTRY DENTIST WITH PORCELAIN WORK.

By **W. G. CRANDALL, D.D.S., Spencer, Iowa.**

(Read before the Iowa State Dental Society at its annual meeting, Des Moines, May 6, 1902.)

THE time *was* when only those dentists enjoying the metropolitan practice of the rich felt it a duty to their patients, and to themselves, to do that class of work which is our highest attainment,—to reach the practical and esthetic results that are attainable only by means of the ceramic art.

Some think such work is only a fad; it is, however, an exceedingly long-lived

fad. To those who are proficient in its mysteries it is a work as fascinating as a sport. That there are difficulties to be met with by the country dentist who attempts this work, all will admit. Among these is the uncertainty in the patient's mind of the permanence of the work; also the desire of many patients for operations more gaudy in appearance. It is not all of us who possess the

artistic instinct for the proper blending of shades to produce the desired effect, which is so much needed in this form of work. But because we all are not artists is not a good and sufficient reason why we should not do our best. Do our worst, we could scarcely make anything look as inartistic as an all-gold crown on an incisor!

In the average country town where the electric current is not available, the gasoline furnace, which is less expensive, is easily controlled, and very durable, can be used.

CONSTRUCTION OF PORCELAIN CROWNS.

There has been so much of merit written on this subject that it seems inadvisable for me to attempt a thorough discussion of the work. Of first and greatest importance in the construction of a crown is the foundation, the preparation of the root. After the canal has been properly prepared and sealed, the tooth should be excised at about one-sixteenth of an inch beneath the gingival border. Grasping firmly a suitable root-trimmer, remove the overhanging enamel until the root walls are parallel, or even conical. It is often a great relief to the patient to use topically beta-eucain, or some other good local anesthetic.

The root being prepared, we take a wire measurement of it. Mark plainly the length and breadth desired upon a piece of No. 29 gauge platinum. The strip should be cut about one line larger than the marking, after which bend it into a circular form and overlap the marking the exact distance of the surplus. It should now be soldered with twenty-five per cent. platinum solder, or pure gold may be used if one is not in possession of the necessary equipment to flow the platinum solder. The band should now be fitted to the root. If the band has been made exact—and it must be for good work—with the necessary trimming, a little persuasion and force will soon have it in place.

This is a good time to be cool-headed and warm-hearted. The distance that the band should be placed gingivally de-

pends entirely upon the case. The free margin of the gum on some teeth is so much greater than of others, that no set rule can be followed. Great care should be taken not to injure the peridental membrane. In the mouths where the free margin of the gum is very small, I do not hesitate to recommend the half band, but we must use as much care and precision with it as with the full band.

Another very convenient and practical method, where the band cannot be worn deep labio-gingivally, is to grind the facing concave and very thin at the gingival part, and place it over the band so that it passes beneath the gum about the depth of the band, thus reproducing the natural bulge at this point, and so be prepared for any recession of the gum that may take place in later years.

The root should now be ground down to the band and the platinum cap completed. The cap is now placed upon the root and a hole punched just opposite the canal. Platinum wire of a suitable gauge for the canal should be taken in the pin-vise and forced through the opening in the cap into the canal, the distance equaling the length of the facing. After proper grinding and fitting it should be removed and soldered to the cap, after which the wire may be excised, leaving about one-eighth of an inch protruding above the cap. We are now ready for the facing, which should match in shade the corresponding tooth on the opposite side, providing it has not been discolored by decay or medical agents.

The higher fusing the material of which the facing is composed, the stronger will be the crown and the better it will hold its color during the baking.

I much prefer fitting the facing in the mouth to obtaining a model and doing the work upon an articulator.

When the facing is properly ground, soft wax should be placed upon it, then put it in place upon the cap and with a warm instrument the two should be waxed securely together. Apply cold water, after which it should be teased from its place and invested in sump or some material equally good.

After the investment has thoroughly

hardened, a sharp instrument should be used to remove the wax, this method being preferable to boiling. Now hold the investment firmly and with pliers bend the pins into contact with the post at a point as near the cap as possible. It is well at this point to flow a little fresh investment over the facing where the wax has been removed to protect it from the flame while soldering the pins to the post. After soldering, the piece should be placed in the mouth and its accuracy noted, and also the quantity of body necessary to back the facing. This is a good time to so shape the incisal edge as to give it a natural appearance.

High-fusing body the shade of the facing should be moistened with alcohol and worked well into the cracks and crevices, and the lingual form should be contoured as desired. It should now be placed in the furnace and the heat turned on until the mass is biscuited. After a proper cooling it should be removed and again built out until the desired contour is obtained. It is again baked until the entire mass is properly fused. Experience is the best teacher for this part of the work; the different furnaces and different bodies making the result quite variable.

The metal band should now be polished and your crown is ready to set, this procedure being the same as for Richmond crowns.

NECESSITY OF PRESERVING THE INTERPROXIMAL SPACE.

I would impress upon your minds the necessity of preserving the interproximal space by proper contact points; I say contact points, not contact. It should be so constructed that a thread when passed through should snap the same as between normal teeth. If this be not thoroughly done the packing of food against the gum septum may result in interstitial gingivitis. A crown so constructed should be a lifelong adornment to the facial anatomy of our patients and a sufficient monument to modern prosthodontia.

There is some difference of opinion as

to the desirability of all-porcelain crowns upon the bicuspid and molars. I will not attempt to advise you upon this, but I do think that the bicuspid should be included in the range of porcelain crowns.

The subject of porcelain inlays is one that is too extensive to more than mention in this paper. Yet the porcelain inlay is becoming so important an operation that we cannot consider ourselves at all modern in our practice if we are not prepared to do this work. The impression has become quite prevalent that the insertion of an inlay is only a temporary operation, but so far in my experience I know of only one that has failed, and that because of my faulty judgment.

The old time glass and low-fusing bodies have served to prejudice the mind in those members of the profession who have had hopeful but sad experience. The higher fusing bodies and the platinum matrix seem to have come to stay; but among the low-fusing bodies the Jenkins system may be considered an exception.

In this work much depends upon the ability to unite art with mechanics. The larger cavities, not the smaller, offer greater chances for success, because of the opportunity for easy access to the cavity floor and walls. In fact, the larger the cavity and more friable the tooth walls, the more practicable becomes inlay work. A modification of the principles given by Drs. Black and Johnson for the preparation of approximo-incisive cavities will serve to build contours larger than you would dare to build with gold, and with little or no discomfort to the patient, saving the tooth to usefulness for years to come. It is well to remember that the larger and thicker the inlay the stronger it becomes.

Many decry the cement, saying that it will wash out, that it is not strong enough, that it will kill the nerve, etc., yet this very cement seems to be preserving the margin around inlays better than any other filling has ever protected them. In fact, I know of no case, neither do I know of a record of a case,

where there has been recurrence of decay at the cemented joint of a well-fitted inlay, let it be gold or porcelain.

The difficulty with inlays in approximal cavities is the necessity for wide separation so that the matrix may be removed without altering its form. This will be one of the difficulties found in a country practice. Our patients often live many miles away, and to come several times to accomplish nothing but

separation seems to them a waste of time. I see little use for inlays in approximal or occlusal cavities in the posterior teeth, but all labial and buccal cavities as far back as the second bicuspid are considered choice locations for porcelain inlays.

Surrounding conditions will modify our choice for or against an inlay. We must be ever cautious lest our judgment be overrun by our ambition.

CORRESPONDENCE.

"ANTISEPTICS IN LOCAL ANESTHESIA."

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I notice an article in the January issue of the DENTAL COSMOS, in the "Correspondence" department at page 44, entitled "Antiseptics in Local Anesthesia." With the writer of that communication (Dr. J. Endelman), I do not believe in using carbolic acid in any preparation that is to be injected into comparatively healthy tissue; the risk is too great.

In this connection I desire to state that for the past three years I have used for

local anesthesia the following combination: Listerine, two drams; distilled water, enough to make three ounces. When I wish to use the anesthetic I add to one dram of the solution a one and one-eighth grain cocain tablet. That makes a two per cent. solution.

In the three years during which I have employed this preparation I have had but one case of sloughing from its use.

Yours truly,

R. H. KENT.

BURLINGTON, KANS., March 12, 1903.

A CORRECTION FROM DR. ROYCE.

TO THE EDITOR OF THE DENTAL COSMOS:

Dear Sir,—On page 122 of your February issue I am reported as having said: "I am pleased to say that the American Dental Society of Europe is very much more ably represented *than* the delegates which have been appointed to this meeting." I doubt the accuracy of this report; if, however, it is correct, it only

proves the truth of that which I intended to say, viz: "I am pleased to say that the American Dental Society of Europe is very much more ably represented *by* the delegates who have been appointed to this meeting."

Yours truly,

WALDO E. ROYCE.

TUNBRIDGE WELLS, ENG., March 3, 1903.

PROCEEDINGS OF SOCIETIES.

INTERNATIONAL DENTAL FEDERATION AND INTERNATIONAL COMMISSION OF EDUCATION: MEETING HELD IN STOCKHOLM, SWEDEN, AUGUST 1902.

International Commission of Education.

(Continued from page 299.)

REPORTS ON DENTAL EDUCATION—*Continued.*

In addition to the reports on dental education presented by various national representatives on Monday, August 18th, as already published (see COSMOS for April, page 292), the Commission of Education received those here given.

The following is a summary of the report presented by EDMUND ROSENTHAL, D.M.D., on behalf of Belgium:

In answer to the first question, which reads, "What are the preliminary studies to be required of students before beginning their professional education?" Dr. Rosenthal said that in his belief it is desirable that students should receive a complete preliminary education of a high standard, and, above all, a useful one. He recommended that the education of the candidate should be carried on in such a way as to insure perfect intellectual development. He should know the literature of different periods and should be conscious of the progressive changes which the human race has been undergoing in order to reach the relatively perfect stage of civilization in which it finds itself at present. He advocated the study of living languages so that the student may readily become acquainted with the nature of the work that may be doing and the progress achieved in the different countries of the globe. He wisely called attention to the fact that the antagonism that has been exhibited toward the dental profession has been generally directed to the lack of proper literary and scientific training of dentists, while their technical ability has never been questioned.

He did not deem it necessary to enter into a discussion of the studies that should be included in the preliminary curriculum, not because he approves of the educational programs in force at present in different countries, but because by following them the dental candidate is put upon the same footing as the

students of the other liberal professions. But besides these studies the future dentist should be made to develop his manual ability from an early age. Manual ability can be acquired. It is not indispensable that dexterity should be an innate quality, for even those that are not naturally so inclined can in time become reasonably skillful. He attaches a great deal of importance to the study of drawing, especially drawings of the head from nature. Every dentist should be able to draw the ideal facial lines of a given type according to its origin, temperament, and special characteristics. The sooner the manual and artistic education is undertaken the more profitable it will be, for by following this plan it becomes possible to devote a great deal more time to the theoretical branches without detriment to the technical ones. The young man who at the age of twenty-two or twenty-three is not capable of using his fingers for anything beyond holding a pen is certainly in need of a professional apprenticeship of longer duration than is the one who has applied himself to the development of his manual and artistic faculties, and who is accustomed to observe and compare, and whose fingers are trained to carry out the suggestions of his brain. It matters not in what direction this manual ability is trained, as long as it exists it can be directed at any time to any line of work; but, if it be wanting, a considerable period of time is necessary to acquire it, and the practitioner will always regret having undertaken too late the manual education necessary to perform the work pertaining to his profession. In carrying out the duties of his calling the dentist is called upon to play the part of artist, sculptor, and creator, inasmuch as he has to modify disfigured faces and to repair the ravages of age. If guided by routine only—that is, by a mere utilitarian comprehension of his profession—he certainly may render useful service, but he will neglect the esthetic side and will never experience the high satisfaction of executing perfect work from the point of view embracing both the artistic and the useful.

The practitioner who applies himself to the

study of nature and strives to imitate her best work ceases to be the handicraftsman and becomes the artist in the full sense of the term; but, with rare exceptions, one cannot become either an artist or a conscientious practitioner without developing the germs of art which exist in every man. Through the manipulation of clay by molding heads after nature and according to selected models that impress upon the mind the lines of the human face, and by classifying these observations, it becomes possible to determine the expression to be given to the edentulous face in order to restore the original beauty that is now absent.

Discussing the second question, which reads, "In what are dental studies to consist, how long ought they to last, and what should be the order of the program?" he said that the course should be one of four years. The subjects of the first year should be—Chemistry, physics, botany, mineralogy, metallurgy, a considerable number of practical exercises, dental prosthesis, drawing, and modeling. Second year—General anatomy, physiology, embryology, pharmacodynamics, general histology, practical work in microscopy, dental prosthesis. Third year—Special comparative anatomy of the mouth, general and special pathology, pathological anatomy, surgical and medical pathology, operative dentistry, practical work in operative dentistry, pathology, microscopy, and dental prosthesis. Fourth year—Medical and surgical clinics, theory and practice of surgical operations, orthodontia, operative dentistry, general hygiene in its relation to dentistry, oral hygiene, physiological and pathological analysis of human secretions, saliva, urine, etc., practical work in operative dentistry, prosthetic dentistry, facial restorations, bridge work, and porcelain work.

In answer to the third question, "What branches of the studies taught in medical schools must the student of dentistry follow?" the essayist said that, with the exception of the practical work in the medical and surgical clinics, all the branches of the four years' curriculum should be given in the dental school according to special programs, but as dental schools are not often in the position to afford the material equipment necessary for the complete education of the dentist, the dental student will have to pursue in the medical schools those courses in science for which the medical laboratories are especially adapted, possessing as they do the appliances and collections of specimens suited to and indispensable for this kind of work. From the fact that part of the staff of the universities and medical schools devote their time exclusively to the study of science and to laboratory work, they are better fitted, in the essayist's estimation, for imparting such instruction than men who have divided their time between teaching and practicing.

Professor Dr. HESSE of Leipzig pre-

sented a report on the status of dental education and legislation in Germany, an abstract of which follows:

DENTAL EDUCATION AND LEGISLATION IN GERMANY.

In Germany the practice of the healing art is free, and the only legal restrictions apply to the use of the titles of *Arzt* and *Zahnarzt*, which belong only to the candidates who have successfully passed the examinations leading to those degrees. Referring to the dental institutions of Germany, he considered it necessary to say a few words regarding their organization, as the several communications which have been lately published by Dr. W. C. Barrett show that foreigners are lacking completely in information on this question. In Germany all professors of dentistry are members of university staffs and are part of the faculties of medicine. Their special work consists in the theoretical and practical teaching of dentistry, and they are in this particular sense absolutely independent. The study of natural and medical sciences is carried out in the university under the direction of the faculty of medicine. Apparently it is this arrangement which has caused Dr. Barrett to believe that our education in the practical branches is inferior to that of the United States. We believe, however, that our organization offers a great advantage, as it permits of a thorough specialization and concentration of the teaching staff to dental science and art; at the same time our students have the opportunity of becoming familiarized with medicine,—an association which we consider important enough to recommend its consideration in the countries in which education is not carried out on this plan.

He then refers to the conditions of admission to examinations leading to the degree of *Zahnarzt*, and describes in detail the various topics upon which the student is examined.

Dr. GUILLERMIN presented the following report:

REPORT ON QUESTIONS PROPOSED BY THE INTERNATIONAL COMMISSION OF EDUCATION OF THE INTERNATIONAL DENTAL FEDERATION.
BY L. GUILLERMIN, MEDICIN-DENTISTE,
GENEVA, SWITZERLAND.

QUESTION 1—"What are the preliminary studies to be required of students before beginning their professional education?"

Two kinds of studies must be considered, namely—(a) the secondary education, and (b) the university theoretical or superior studies.

(a) The secondary (preliminary) studies should be the same as for the study of medicine.

(b) The superior studies, in my estimation, should embrace the complete study of medicine, but it would be desirable in view of its extensive scope to limit the course in medicine

to four years. This would constitute, not the basis of the cone as advocated by Sir Michael Foster in Cambridge, but the trunk from which would branch out the different specialties, otology, laryngology, ophthalmology, stomatology, etc.

If the organization of dental education upon this basis could not be carried out, the plan adopted for the obtaining of the Swiss federal diploma is the one that we would advocate. In this curriculum one year is devoted to natural sciences (physics, inorganic and organic chemistry, botany, zoölogy, and comparative anatomy), one to the medical sciences (anatomy with dissection of the muscles, vessels, and nerves of the head and neck; practical work in microscopy and theoretical anatomy), histology, embryology, and physiology in their bearing on dentistry; practical courses in general pathology and pathological anatomy and in special pathology and therapeutics of the mouth; attendance during two semesters upon one of the surgical clinics.

QUESTION 2—"Of what are dental studies to consist, how long ought they to last, and what should be the order of the program?"

After the pursuance of the theoretical studies above indicated, a minimum of two semesters should be devoted to clinical dentistry, three semesters to prosthetic dentistry, and three semesters to operative dentistry. In Switzerland the law regulating medical examinations allows the three semesters on prosthetic dentistry and the three semesters on operative dentistry to be taken in the laboratory and in the office of a licensed dentist.

In the dental school of Geneva the curriculum is so arranged that the professional studies may not take up more than three semesters. In some countries, as well as in some of the cantons of Switzerland, the diploma of physician gives *ipso facto* the right to practice dentistry. This is a provision which we disapprove of, as we believe that physicians should not be permitted to enter upon the practice of dentistry unless they have pursued three semesters of its professional studies.

This report was followed by one on "Dental Legislation in Switzerland," by the same author. A *résumé* of this report is here given:

DENTAL LEGISLATION IN SWITZERLAND.

In the canton of Geneva the dental school grants the diploma of *médecin-chirurgien-dentiste*, which has now been substituted by the licentiate in dental surgery. This diploma confers by itself the right to practice dentistry, but only in the canton of Geneva. Incidentally it may be stated that the diploma of doctor of medicine of the faculty of Geneva likewise confers only the right to practice medicine in the canton in which it is granted.

These diplomas are easier to obtain than the federal diplomas. The dental school of Zurich does not issue diplomas; it merely prepares the students for the federal examinations. The federal diploma is one of the requirements for admission as a regular member of the Swiss Odontological Society. By a singular anomaly in a country as enlightened as Switzerland, one canton, that of Glarus, and two demi-cantons, those of Basle-Campagne and Appenzell, have declared that the practice of medicine and dentistry is free. It must be added that sometimes the authorities of some of the cantons confer the right to practice to holders of foreign diplomas provided that they confer the right to practice in the countries in which they are granted.

Physicians, except in some cantons, as in Zurich and Berne, have likewise the right of practicing dentistry without the necessity of any special professional training. Dental education is given in Switzerland in two schools, that of Geneva and that of Zurich. Recently the chair of odontology has been created in the University of Basle. This course comprises—(1) Pathology and therapeutics of the mouth and teeth; (2) anatomy of the mouth and teeth; (3) diseases of the mouth and teeth; (4) operative dentistry and prosthesis; (5) stomatology. Courses 1, 2, and 5 are given at the university; courses 3 and 4 in the office of the professor.

The following additional report on dental education in Switzerland was presented by the delegates of the Swiss Odontological Society:

REPORT ON THE THREE QUESTIONS PROPOSED BY THE INTERNATIONAL COMMISSION OF EDUCATION OF THE INTERNATIONAL DENTAL FEDERATION. BY L. C. BRYAN, D.D.S., THEODORE FRICK, D.D.S., AND PAUL GUYE, D.D.S.. DELEGATES OF THE SWISS ODONTOLOGICAL SOCIETY.

QUESTION 1—"What are the preliminary studies to be required of students before beginning their professional education?"

The preliminary studies should be equivalent to those required from medical students. Considering, however, the importance of languages, the preference should be given to a baccalaureate degree comprising one living language besides the native language of the candidate. It would also be advisable that part of the time should be devoted to drawing and to mathematics.

QUESTION 2—"In what are dental studies to consist, how long ought they to last, and what should be the order of the program?"

The studies should cover four years. The practical exercises in the laboratories, clinical and otherwise should take up a large portion of the student's time, and should begin (especially prosthetic dentistry), with the first semester of the course.

(The three delegates approved the conclusions presented by Dr. E. D. Rosenthal, D.M.D., Brussels, but stated that besides the topics mentioned by the Belgian delegate, technical requirements as practiced to-day in the best schools of America should be included in the program.)

QUESTION 3—"What branches of the studies taught in the medical schools must the student of dentistry follow?"

(In order to abbreviate their report, the delegates stated that they fully agreed with the answer to this question as presented by Dr. Rosenthal.)

Dr. E. D. ROSENTHAL, Brussels, Belgium, then presented an additional report, on "The Conditions of Affiliation of All Dental Schools with the International Commission of Education."

Reports on "Dental Legislation" were presented by Dr. Maurice Roy, France; Dr. Jos. Arkövy, Hungary; Dr. Chas. E. Pearson, Canada; Dr. Weiser, Austria; Dr. E. D. Rosenthal, Belgium; Dr. V. Haderup, Denmark; Prof. Limberg, Russia; Drs. L. C. Bryan, Paul Guye, and Theodore Frick, Switzerland.

MINUTES OF MEETING—MONDAY,
AUGUST 18TH.

Morning Session.

The Commission was called to order in the Grand Hotel at 9.15 A.M. by the president, Dr. Truman W. Brophy.

The *first question* proposed by the International Commission of Education was brought up for discussion.

Dr. AGUILAR proposed the following amendment:

"In order to be admitted into a dental school, the applicant should have the same preliminary education as required from students of medicine, law, etc., before they are admitted into a university."

He opposed the suggestion that the student should take a manual training course before entering the dental school.

Dr. GUERINI spoke on the imperative necessity of preserving the high standard of preliminary education.

Dr. JENKINS approved the amendment as presented by Dr. Aguilar.

Dr. GODON stated that a preliminary manual education is necessary, and he opposed Dr. Aguilar's amendment.

Dr. GUILFORD agreed with Dr. Godon's views concerning the advantages of preliminary manual education for the dentist.

Drs. GULDBERG and FÖRBERG were of the opinion that manual training should commence after the entrance of the student into the dental school.

Dr. AGUILAR proposed, so as to make his amendment applicable to all countries, to add the words "or equivalent" after the word "same."

Dr. E. H. SMITH considered that this addition was not fully satisfactory.

Dr. QUEUDOT stated that the preliminary education for the dentist should be the same as for other professions.

Dr. FRANK was not in favor of Dr. Aguilar's amendment, and asked how this preliminary manual education should be carried out.

On motion of Dr. HARLAN, it was decided to refer the amendment presented by Dr. Aguilar to a committee composed of Messrs. Harlan, Godon, Aguilar, Hesse, Harding, and Smith, in order to frame it so that its application to every country should be possible.

President BROPHY objected to this amendment, as it would lower the status of dental education in the United States by reason of the inferior standard of some medical schools in that country.

After a long and agitated discussion the question was referred to the next session of the Commission, and the meeting then adjourned.

Afternoon Session.

The meeting was called to order at 3 P.M. by President Brophy.

On motion of Dr. EUGENE H. SMITH, the following answer to the first question was adopted—

"The same qualifications as are required from students of medicine and of law in those countries in which professional schools are under the supervision of the government, or equivalent qualifications in countries in which such supervision does not exist. The equivalence of these qualifications should be determined by the secretaries of public education of the respective governments."

On motion of Dr. GODON, the question

of preliminary manual education was referred for discussion to the next session of the Commission in Madrid.

The Executive Council was directed to prepare the questions to be discussed at the next session of the International Commission of Education.

The report by the secretary-general of the Commission of Education, Dr. Roy, was adopted, and the Executive Council was requested to prepare a report on the same subject to be presented at the next meeting.

The following officers were then unanimously re-elected: Dr. Truman W. Brophy, president; Drs. Patterson, Zsigmondy, Kirk, and Cunningham, vice-presidents; Dr. Roy, secretary; Drs. Frick and Guye, adjunct-secretaries.

President BROPHY thanked his colleagues for the support, kindness, and confidence which had been bestowed upon him, and for his re-election as chairman for the ensuing year,—an office which, he said, he hesitatingly accepted. He also thanked his colleagues for the interest and activity shown in everything concerning the Federation work, and congratulated them upon the results obtained, which, notwithstanding the existence of some differences of opinion because of the differences in the character and nature of dental legislation in different countries, was excellent, promising a great deal for the future.

The Commission then adjourned to meet in Madrid in April 1903.

(To be continued.)

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, November 1902.

(Continued from page 304.)

Dr. W. V-B. AMES of Chicago then read a paper entitled "Bridge Work as a Possible Factor in the Cure of Pyorrhea." (Printed in full at page 355 of the present issue of the COSMOS.)

Discussion.

Dr. WALKER. Do you mean that you take the roots out and band them, and put them back in the sockets?

Dr. AMES. Certainly, if they have little or no attachment.

Dr. PERRY. Do I understand you to say that you use the same roots?

Dr. AMES. Yes. The socket has been kept open by the teeth being ligated in position; the same root is made perfectly clean and a little cut off the end, giving a slightly rounded end.

Dr. WALKER. Do you fill the roots?

Dr. AMES. If I find any canal to fill. When the teeth are extremely loose or entirely detached the amputation is so

low that the filling of the mere trace of a canal in the root portion is of little consequence.

Dr. PERRY. Why should not Dr. Ames insert perfect roots from which has not been denuded the investing periosteum? I have had marked success in setting back fresh roots, and have repeatedly cut off what I considered old, bad ones and attached new and good ones, and have had marked success in so large a number of cases that it will take a great deal to convince me that such a procedure is not scientific practice.

The encasement which Dr. Ames has shown is an added advantage because it holds the teeth firmly in place. I have in mind the case of a gentleman I saw only a few days ago. Into the socket from which a lateral had been lost I placed a new root attached to an artificial crown, and the crown in addition was attached to the adjoining canine by

a pivot which went into the root through a hole drilled on the lingual side of the canine, which was dead. Now, you might say, why should I not let that socket fill up with new tissue? I did it, as Dr. Ames did, with the idea of getting a nicer condition of the gum by having it heal, having the root set into that gum, and I think it had a better appearance than if I had cut the root off entirely, because in a few months there would have been a recession of the gum, and not as nice a fit. It is somewhat after the manner Dr. Rhein has described, of placing in artificial roots and allowing the gums to heal around them, which I believe to be perfectly practicable under certain conditions.

Dr. HATCH. What do you mean by fresh roots?

Dr. PERRY. Such as you find in a box of old teeth,—using your judgment—taking a root that has not been lost by the accumulation of tartar or pyorrhea, but which you have intuitive belief will grow fast. One who has had experience in the implantation of teeth can after a while tell which roots will grow fast, and which will not. My experience in the replantation or implantation of teeth is that older roots are the ones that grow fast and do best. I have not much faith in the implantation of young roots—I cannot say why, unless it is because the old ones are more dense and have more attachment, although I do not think there is much attachment anyhow from implanted teeth.

Dr. Shannon of Brooklyn showed me many years ago a lower left bicuspid which a man had been in the habit of taking out of his mouth, showing to his friends and putting back again. The gum had grown hard and cartilaginous around it and he put it in and took it out at his pleasure, and yet it served its purpose. Being in the lower jaw its weight helped to keep it in, and the man said it was a useful tooth.

Dr. RHEIN. The part of Dr. Ames's paper that I find particularly interesting is the one in regard to the permanent fixation. I do not know whether or not he intended to leave the inference that

he recommends fixation or permanent splinting of the teeth invariably in all cases of loosened teeth. I do not suppose he has such an intention, but generally an erroneous impression is left in the minds of the readers of an article of this kind that the author recommends permanent fixation in all cases of loosened teeth.

I want to say, in reference to that, that I have given a great deal of thought and attention to the value of permanent fixation in loosened teeth, but I believe that at the present time it has very strong limitations. By that I mean that there are a certain number of cases where this sort of fixation is very beneficial; there are, too, a large number of cases of loosened teeth where it is absolutely unnecessary in order to permanently tighten and preserve those teeth. I merely make this remark in reference to the paper in order to correct any idea that all loosened teeth ought to be banded or tied up and permanently fixed. I recollect very well a case of an upper lateral incisor that came under my care about a year ago, in which to-day the tooth is perfectly firm. The pulp has been removed from it, and you would not suspect any trouble of that kind. About six weeks after I commenced the treatment of it the patient informed me that a friend of his had described his case to a very well known dentist in this city, who told him that he never would get any satisfactory results unless the teeth were permanently fixed or united.

It is impossible, in discussing a paper of this kind, to attempt to speak of all the different kinds of loosened teeth that should be fixed and those that should not, but I want to make this as strong as possible because I have seen an enormous amount of unnecessary banding and ligating of loosened teeth. The advantage of ligating teeth temporarily where they can be better treated during such ligation is another question, and brings up an entirely different condition of affairs.

Another point that I wanted to bring up—and I trust the essayist will pardon

the spirit in which I differ with his conclusions—is this: I can readily perceive how easy it is to fall into what I believe to be the error of supposing that the intense and severe stress of mastication would produce a traumatism sufficient to loosen a tooth. This is well marked in such cases as Dr. Ames has so lucidly described to us, where it is evident that one tooth is doing more than its normal share of work. It is very easy to fall into such an error of conclusion as Dr. Ames has given us; and I want to say in putting forward my view, that I may be in error and he may be right. As a rule these teeth did not originally have this greater stress of mastication. I am sure the majority of men will bear me out in this conclusion,—that this lengthening of a tooth or a greater use of it, as we find when the tooth is loose, is a result and not the original condition of such a tooth. The reduction of such a tooth to its normal occlusion, the putting of the mouth into such condition that the entire arch should bear an equal amount of strain would remedy the difficulty. It is the only rational method of treating any condition of loosened teeth.

The deduction of Dr. Ames that it is a condition of traumatism, due to exaggerated use of that tooth, is one that I do not think a careful study of the pathological conditions will bear out. I believe that the disease of the peridental membrane that exists in those cases is due to nothing else than a diseased condition of the dental pulp, and this diseased condition of the pulp (of which there are so many various kinds that we do not begin to have an idea of them) is the immediate cause of the trouble affecting the nourishment of the peridental membrane and the consequent lengthening of the tooth.

It is incompatible with my understanding of the function of the articulation of the teeth in the sockets to suppose that mastication could produce any such disease of the peridental membrane as we see in this condition. When we remove the pulps from a large class of these cases with no further treatment other than the ordinary hygienic care

of the mouth, making certain that there is no unnecessary strain upon the occlusion of a particular tooth, we obtain a perfect reversion to the normal condition.

Dr. GILLETT. The general principle of fixation for these teeth is a valuable one. The point that had been in my mind was very much the same as that made by Dr. Rhein. In such cases as it has been my lot to care for, I have preferred to keep the means of fixation away from the gum. It has more frequently happened in my own experience that lower incisors were the teeth needing such treatment, and in several cases I have followed with satisfaction the general line of treatment described to me by Dr. Fossume. Dr. Fossume has already described the process before this society. It can be used in most cases without objectionable showing of gold—in fact, it would seem to me much less objectionable in that respect than the method illustrated in Dr. Ames's figures.

I feel that in some cases we endeavor to keep such teeth too long. I have in the box in my cabinet in which I keep the odd specimens a tooth which I have kept as a reminder to myself not to always insist upon trying to preserve a tooth after its usefulness has passed. I succeeded ten or more years ago in persuading the patient to have this doubtful tooth preserved, and I succeeded so well that she kept it about five years longer than it ought to have been in her mouth. In cases where the teeth become necrosed and the adjacent tissues become diseased, it is questionable policy to try to keep them; but in the cases where I do want to keep them I also desire to give the patient every possible aid toward maintaining cleanliness, and I feel with Dr. Rhein that this end can better be accomplished by keeping the means of fixation well up toward the top of the tooth, the occlusal end, so that the approximal spaces may be thoroughly washed and cleansed by ordinary means.

Dr. LITTIG. I have seen as good success from the extraction of teeth and subsequent implanting as I have by any other treatment. I have one case in mind

which presented loose teeth which I tried to fasten by inserting pins to hold them rigid. Those teeth were later taken out and replanted, and to-day they are as firm as they were when I first saw the patient. Fixtures in such cases are unnecessary if the implantation be properly done, and I could not understand what Dr. Perry meant when he said that a tooth that had been deprived of its membrane would not grow or fasten itself to the tissues surrounding it as well as one which had not had it removed. Why an old dry membrane on a tooth that has been in the office for a year or longer should be different from any other tooth, after it is scraped and freshened, I cannot understand. Certainly the teeth I referred to lasted long enough for me to cite as a good example. I do not speak of cases that come one day and are gone the next, but these teeth have lasted five years and I know about them.

Dr. PERRY. I take it that there is something on the surface of an old root that is perhaps microscopic, which might be reduced or overcome by the saturation of that tooth in acid long enough to dissolve away the whole surface; but if I can get a fresh tooth which has never had any incrustation on it, I am more certain of getting an attachment than with an old root. It is not the tartar which remains on the surface of it, but that which penetrates into the microscopic sponge-like peripheral surfaces of the tooth. I would rather have the microscopic openings in a natural condition and let the tissue grow into it than to have an old tooth which is so closed over and so hard or horny that the soft tissues do not grow in; and yet, as I said before, I do not want a young tooth. I do not for a moment think there is any real attachment between the gum and the substance of the tooth. I think it is only a toleration of the tooth, but it knits into those little spaces so as to hold the teeth in place. If it be a lower tooth, it does not need any hold; if it be an upper, it requires to be only slightly retained. The success of the implantation of the tooth is not a strange thing after all, because it requires only a little to

keep the tooth in place. If Dr. Shannon's patient's tooth could be taken in and out at will, and if it could stay there and be comfortable, but little more is required to keep an implanted tooth there.

Dr. AMES. In saying as little as I did in the paper about scaling and therapeutic treatment, I did not intend to under-rate such methods. These and mechanical fixation of course go hand in hand, and the more thoroughly we can scale teeth the better will be the outcome.

I think there is something valuable in Dr. Perry's remarks about obtaining better results with the root of another tooth than the root of a tooth which has been carried in the socket, and yet my results have been so satisfactory in the return of the root of the same tooth that I do not waste time in looking around for any other, having one which belongs right there. If I obtained any better results with fitting some other root than by returning the original, after making it decently clean and giving it a polish and taking off the pointed end, I think I should be overjoyed.

The results that I see are as I describe them. The tissue becomes ultra-healthy. There is a sort of cartilaginous adherence of the tissue, making it impossible to pass an explorer between the root and the tissues. I do not attempt to say what the attachment is.

Like porcelain roots, it may be that these roots have nothing more than a mechanical occupation of the socket; but I am inclined to think there is something further.

In the replantation of such teeth as spoken of by Dr. Littig, it has been my experience that bicuspid can be extracted, cleaned, and replanted, and held for only a few weeks, for a sufficient attachment. With the incisors, from their shape and from the size of the root, it is necessary to permanently fix them with a splint, and it is in such cases that I have had sufficiently satisfactory results to warrant me in continuing the work.

By keeping those teeth which have but little attachment and returning those to their sockets which have no attachment,

I get a better result, and one more pleasing to me and to the patients, than with any bridge I could construct after extraction. As these very teeth, which for several years have been ligated and with such ligation have needed the removal of serumal calculus and constant therapeutic treatment, return from time to time with almost normal condition and little salivary calculus, giving satisfaction in mastication, it certainly would take more than the average argument to cause me to return to the extraction of such teeth and the making of plates or bridges, or anything which will give an abnormal condition at the alveolar margins. The extraction gives an unnatural condition which will affect for a time at least the patient's speech, and will not be to my eye as satisfactory. The question has arisen regarding the possibility of drilling each side of a pulp for the insertion of pins. While I have no sentiment over the retention of a vital pulp at the age of most patients presenting for such treatment, I can say that because of the age of the patient this can usually be safely accomplished; but I do not go on record as recommending it. The pulps of such teeth I almost universally devitalize as a first procedure.

I regret that the discussion did not run more to the advisability of bridges and extension saddles in connection with loose roots instead of being confined so closely to the special splint. According to my observation, the failure of all sorts of bridges depends upon the element of lateral strain. Short bridges in the upper or lower jaw, reaching from bicuspid to molars, which fail from the loosening of the roots in the sockets, do so because of a lateral stress, and I cannot help but believe (this is an observation, not a theory) that the lateral stress and strain from constant jarring creates a traumatism of the roots to the extent of setting up a retrograde process, which accounts for the pockets and as a result the deposition of the serumal calculus.

I think it is found that where the bridges are more extensive, taking in the two sides of the mouth with a span from a canine to a third molar, there may be

more strain upon that bridge than the canine and third molar would stand of themselves; yet such a bridge succeeds because of the fact that it continues to the other side of the mouth, and the application of stress upon that part of the bridge gets not only the help of the canine and third molar, but the help of every anchor-tooth in the mouth. So, wherever we can, I believe we should so construct a bridge that there is not the possibility of lateral stress with the result of a traumatism.

In presenting a study of this kind, one is bound to appear to be going to extremes. As Dr. Rhein said, it might look as though I were advocating it for all cases, but of course I do not. In the majority of cases where there is a marked constitutional disturbance, we do not have any great amount of destruction of tissue. The roots are not exposed to any great extent, but we have an acute condition. Of course I would not advocate in such cases the application of a splint. If there is any help for the patient at all it will come without any such expedient, unless it be merely an expedient, a temporary splint; but oftentimes there is no really permanent help. We see these cases with patients in the last stages of tuberculosis and diabetes, and it is only a question of tiding them through as best we can till the demise.

Dr. Rhein spoke of the stress not being the probable original cause of the trouble, when the teeth as presented are slightly elongated, originally being of proper length. Now, a tooth does not need to be abnormally long to get excessive strain. One tooth may be getting more than its proper amount of work, without being abnormally long; with what result? According to my belief, not based on a mere theory but supported by facts borne out by observation, the result of this excessive stress is traumatism—repeated traumatism. The effect of this is the retrograde process and the deposition of serumal calculus. It will not help the tooth to cut it down to a proper length, or an improper length, unless that excessive strain be relieved to

a greater extent than it will be by cutting down. Destruction of the pulp will help somewhat, I think, and then the mechanical fixation will put that tooth in a condition to become an almost perfect member.

Dr. Rhein thinks I have come to erroneous conclusions. My position indicates that I think Dr. Rhein and most others have overlooked a factor in the etiology of this condition of which we talk so much.

Dr. WALKER. Before we adjourn, I wish to offer a vote of thanks for this very able and interesting paper, which has brought out such an amount of discussion. We all know what it means to take a week out of a busy practice and come from Chicago to New York at this season of the year, and I hope this vote of thanks will be unanimous.

Motion unanimously carried.

Dr. WALKER. We should attend to the matter of the Peruvian mummies presented to this society by Dr. Hanning. I move that our curator, Dr. Bishop, make a place for them somewhere in this case [indicating]. It is an easy matter to push along and renumber some of these specimens, and the mummies can be placed there and tabulated. A little plate of some kind should be attached to them, saying they were presented by Dr. Hanning. The burlaps or covering in which they came should also be placed there. They are very valuable, and I consider it a great compliment to this society.

The motion was carried, and the meeting adjourned.

NOTE.—For the society's December meeting (election of officers), see April COSMOS, page 341. The anniversary meeting, January 1903, here follows.

Anniversary Meeting—January 1903.

The anniversary meeting of the New York Odontological Society was held January 20, 1903, at the Academy of Medicine.

CLINICS AND DEMONSTRATIONS.

The clinics and demonstrations began at 9 A.M. and continued during the day.

1. Dr. EDWARD H. ANGLE, St. Louis, exhibited and demonstrated in a systematic manner on models his methods of procedure in various classified cases in orthodontia. He showed the cases before and after treatment, the forms and appliances used, and the methods adopted in connection with their use. During the morning he gave a lecture, accompanied by a lantern-slide exhibition, on the subject. Dr. Angle spoke as follows:

Mr. President, Ladies and Gentlemen: It is with much pleasure I invite you to consider with me this morning some questions bearing on the intensely interesting and very important branch of science known as orthodontia. No doubt

we shall differ on many points, but I trust these differences will be honest ones. As the result of my observations and experiences I have arrived at certain definite conclusions which I wish to lay before you for your thoughtful consideration.

First: I believe that orthodontia has made such advancement that we may now regard it as an exact science, or more nearly so than any other branch of medicine; that each individual case is no longer encompassed in chaos and mystery in regard to its diagnosis, art relations, and requirements of treatment, but that it is governed by rules as fixed and definite as those governing the development and eruption of the teeth, or even more so.

Second: I believe that all operations in orthodontia should be weighed and balanced from the standard of normal occlusion; that it is the one principle which should guide us from first to last in the treatment of every case.

Third: I believe that the full com-

plement of teeth is essential to the best results in the treatment of all cases, and not only is this true of the occlusion, but it is demanded by the art relations of the face as well.

Fourth: I believe that the resort to extraction for the supposed prevention or correction of malocclusion is as useless as it is pernicious, and that it is no longer excusable, but reprehensible, and that the oft-enunciated theory that the child inherits large teeth from one parent and small jaws from the other is absurd and cannot be proved. I believe that acting upon this theory has been the occasion of immeasurable harm and that it ought to be abandoned.

Fifth: I believe the period for the beginning of treatment of cases, instead of being vague and indefinite is fixed and important, and that it occurs with the eruption of the four first permanent molars; that these teeth are the most important of all the teeth and that they should never be sacrificed, but zealously guarded; that they are to a very large extent the molders of the whole dental apparatus, and that they are the true points from which to begin the diagnosis as well as the treatment of all cases.

Sixth: I believe the relations of the teeth of opposite arches are so intimate and powerful that equal care must be directed to both; if any preference be shown it should be to the lower, it being such an important factor in the molding of the upper.

Seventh: I believe the dental apparatus as a whole in its muscular and rhinological relations should be thoroughly considered in every case, instead of, as is commonly done, considering the mere symptoms alone as usually manifested in the mal-arrangement of the incisors.

Eighth: I believe the regulating appliance is of very minor consideration compared to the knowledge which should direct it. I believe that practically all orthodontic operations can be best performed with one or two appliances, and that a vast percentage of those with which we are all familiar could with profit be dispensed with.

Finally, I believe that orthodontia is a

specialty and that it ought to be studied, taught, and practiced as such.

Dr. Angle then sought to prove the points above outlined by a large number of pictures of cases he had treated, which were projected upon the screen. These embraced a large number of cases belonging to each class and sub-class of malocclusion—and these, too, not the easy cases, but, as he said, the most difficult among the large number which he had treated in the past fifteen years; and the changes shown were to many a real revelation.

(In the afternoon the doctor gave a table clinic, where the models from which his stereopticon slides had been made were shown. The models were beautifully and artistically made, and the results which they showed awakened much interest.)

2. Dr. W. A. CAPON, Philadelphia, demonstrated a method of constructing contour porcelain inlays or tips with a wire loop or pin attachment. The method is as follows: Burnish thin platinum over the surface of the natural tooth to be repaired, and fit a loop or pin of platinum wire, No. 24 gauge, to the interior of the cavity; then hold the matrix and wire in position on tooth, and apply porcelain body mixed with water and gum tragacanth. Carefully draw the combination from the tooth and fuse in furnace. This method avoids soldering. Dr. Capon used the method in the formation of a porcelain tip and corner with a loop and pin attachment for an upper central incisor.

Dr. Capon also demonstrated a new method for effecting an attachment of oxyphosphate cement to the surface of porcelain. The porcelain is painted with a substance called "media;" the porcelain is then placed in a furnace and the "media" fused over the surface. Zinc oxyphosphate when mixed to a sticky consistence will adhere to porcelain so treated with great tenacity, as was shown by breaking sections of porcelain so attached; in each case the cement would not leave the porcelain. The method was demonstrated as being particularly

useful in repairing broken facings on bridges and crowns.

3. Dr. F. W. ALLEN, Philadelphia, demonstrated the use of his "mechanical section grinder" for the preparation of microscopical sections. By its use, sections of teeth or other substances are much more easily ground of uniform gauge and preserved for examination, than by the methods usually practiced.

4. Dr. G. E. HARDY, Baltimore, demonstrated the subject of gold inlays.

5. Dr. O. E. INGLIS, Philadelphia, demonstrated the method he practices to form a gutta-percha canal-point that will accurately fit a canal. The points are made of pink gutta-percha by gradually rolling pieces of it down on a glass or porcelain slab with an ivory spatula, fitting the point in the canal occasionally as the operation proceeds, to determine the exact size and form. The section of the gutta-percha toward the point is then cut off in accordance with the length of the canal.

6. Dr. S. S. STOWELL, Pittsfield, Mass., demonstrated a spur-anchor, for one end of a dental bridge. The method is described as follows:

A large gold filling is placed in the posterior proximal surface of a tooth—a canine, for example; a large dovetail or box anchorage is made for the filling in the thick palatal shoulder of the tooth, and all other anchorage grooves are made deeper and stronger than usual. The margins of the filling are brought well out from between and away from possible contact with the bridge. In the surface of this filling a hole is drilled, on a line longitudinally with the tooth, to the depth of one-sixteenth of an inch. In shaping the cavity and in inserting the filling, this hole should be kept well in mind, as it must not go through the filling to the dentin at any point. Into this hole a platino-iridium or clasp gold wire is loosely fitted, No. 14 or 16 gauge. A disk of 24-k. gold, No. 30 gauge, is burnished to fit the surface of the filling, perforated to receive the wire, which is

next attached, with 22-k. solder. The disk is then put back in place, and again burnished and trimmed, as it must not overlap or come in contact with the enamel at any point.

The bridge is now constructed in the usual manner, by crowning some posterior tooth with a gold cap. An impression is taken with the disk and crown in place. From this a model is made, on which the disk and crown will appear in position as in the mouth, and in soldering the disk and spur will become part of the bridge. When finished the bridge should be connected only to the posterior tooth, the spur being left as a loose socket to support the anterior end and to permit vibration when in use. Models of practical cases were shown that had been in use from five to fifteen years.

7. Dr. J. P. CARMICHAEL, Milwaukee, explained the use of his method of constructing shell or open-faced gold caps of the so-called "staple crown" pattern, for the support of bridges; also his method of forming hollow metal rolled posts for crowns, which will accurately fit the crown and permit easy removal.

8. Dr. R. GOOD, Chicago, gave a clinic showing his method of operating in pyorrhea alveolaris cases.

9. Dr. R. M. SANGER, East Orange, N. J., described a method of preparing a fractured tooth for crowning.

10. Dr. F. T. VAN WOERT, Brooklyn, N. Y., took negatives of cases presented with his X-ray apparatus, and developed the photographs.

11. Dr. W. B. DILLS, Brooklyn, N. Y., demonstrated with a pyrometer the fusing-points of various porcelain bodies, baked in an electric furnace.

12. Dr. R. L. WATKINS, New York, demonstrated with the microscope the examination of fresh specimens of the human blood, for the diagnosis of disease, and such conditions of the system as tend to the development of pyorrhea alveolaris.

13. Dr. L. C. LEROY explained on models the methods he practices in orthodontia.

14. Dr. J. HEAD, Philadelphia, exhibited and explained his method of constructing a removable porcelain bridge, supported by means of clasp and flange attachments upon the adjoining teeth.

15. Dr. M. L. RHEIN, New York, exhibited models on which were placed natural teeth, to demonstrate his devices for splinting loosened teeth and for carrying missing ones in pyorrheal cases. Dr. Rhein also read a paper on this subject, accompanied by numerous illustrations. For the paper see page 369, and for the discussion which ensued see afternoon session (opposite page).

16. Dr. H. W. GILLET, New York, demonstrated the use of an hydraulic crown-press and also aseptic absorbent points for drying pulp-canals.

17. Dr. W. M. DAILEY, New York, demonstrated the method he practices in the insertion of combined soft and cohesive gold foil fillings. The soft foil is inserted with diamond point pluggers. In the insertion of the cohesive foil a rolling method is used, by which he considers that the gold is adapted more closely to the walls and edges of a cavity, the danger of shattering enamel walls and edges is diminished, and the liability of leakage reduced.

18. Dr. M. H. CRYER, Philadelphia, exhibited the anatomical specimens from which illustrations in his work, "Studies of the Internal Anatomy of the Face," were made.

Dr. Cryer presented four patients whom he either had under treatment or had operated upon. The first patient was a young man who had been afflicted with sarcoma. The anterior portion of the mandible, extending from the first molar on one side to the first molar on the other side, had been removed, and a substitute for the removed bone inserted at once. After the parts had healed the temporary appliance was removed, and a permanent one inserted, attached to the

molars, with the anterior teeth mounted on it. This appliance keeps the stumps of the mandible in place, and enables the patient to eat quite satisfactorily.

The second patient, an elderly woman, presented a case of fracture of the lower jaw in the region of the third molar, caused by extraction, which being neglected resulted in ankylosis of the temporomandibular articulation and the formation of a new joint near the angle of the jaw. The inferior dental nerve, becoming impinged between the fractured portions of the bone, caused neuralgia. Dr. Cryer, on being consulted, cut into the bone and removed the impinged sections of the nerve. He did not unite the fracture, but decided to let the patient use the false socket, which she appeared to do quite comfortably.

The third patient was a child about seven years old. Four months ago she was sent to Dr. Cryer for treatment. He found necrosis of the right half of the lower jaw-bone, extending from near the symphysis to the condyloid process. The indications pointed to removal of the dead bone, but as the operation, from the conditions present, would be a grave one, and also as the periosteum seemed to be alive and would produce a new growth of bone, he concluded to allow the dead bone to remain and act as a splint to hold the other portion in position while a sequestrum formed and new bone was produced by the periosteum. The case seems to be doing as Dr. Cryer expected, and portions of the dead bone are gradually coming away.

The fourth case was that of a man on whom three operations for leucoplakia had been performed, and who requires another to remove a slight patch of the disease yet remaining.

19. Dr. S. G. PERRY, New York, exhibited his improved electric light for illuminating the mouth.

Dr. Perry also exhibited a separator possessing the novel property of acting as a combination of separator and matrix. (A description of this interesting combination will be published in a subsequent issue of the COSMOS.)

20. Dr. E. HILLYER, Brooklyn, demonstrated the formation of gold matrices, and the use of "Jenkins" porcelain in inlay work.

21. Dr. GEORGE EVANS, New York, exhibited, and

Dr. GEORGE A. WILSON, Jr., demonstrated, the use of gutta-percha cement, and the instruments and appurtenances connected with its use, for the cementing of crown and bridge work. The use of this cement renders the work at any time detachable.

22. The S. S. White Dental Mfg. Co., represented by Dr. V. W. GILBERT, exhibited fused specimens of their own and other makes of porcelain inlay materials, which showed the comparative merits of high- and low-fusing porcelain for inlay and crown work.

23. Dr. A. A. WILCOX demonstrated the properties of "Aura-percha." It consists of a preparation of minute pellets of gutta-percha. A pellet of heated gold foil is applied to one or two of the pellets, which softens and causes them to adhere to the gold. The gold pellet is then placed and pressed in position in the bottom of the cavity, and is retained there by the adhesion of the gutta-percha. It thus forms a foundation on which to build instead of using retaining pits.

24. The S. S. White Dental Mfg. Co. also exhibited "Moss Fibre Gold," and Dr. HINKSON demonstrated its advantages in respect to softness, cohesiveness, and the rapidity of condensation which it permits.

25. The Griswold Dental Bridge Co. exhibited and described their methods of constructing removable bridge work, and explained the improvements they have lately made in attachments and the advantages claimed over the forms they first introduced.

Afternoon Session.

The paper by Dr. M. L. RHEIN, New York city, entitled "Splinting Loosened

Teeth in Pyorrhea Alveolaris" (printed in full at page 369 of the present issue of the DENTAL COSMOS) gave rise to the following

Discussion.

Dr. RHEIN. This [showing model of Fig. 11—see page 372] represents one of the cases mentioned, the object being to show the manner of tying the wire and also how the button of Harvard oxyphosphate of zinc cement should be set in position. It is readily understood that, in the finished splinting, the celluloid will be brought around the teeth so that every portion of the silver wire is hidden from view, leaving only the smooth surface of the celluloid.

A MEMBER. Will Dr. Rhein tell us how to make the celluloid cement?

Dr. RHEIN. As it is easily made, it is preferable to make it fresh as you wish to use it. It is made by dissolving as pure celluloid as you can get in acetone, which is a perfect solvent of the celluloid. As celluloid alone leaves it a little too thin, I add some tin oxid to it. The celluloid alone would be sufficient, but the tin oxid gives it more of a natural tooth-color as well as more body. It is not necessary to give the exact formula of the amount of acetone, because you can judge of that by the consistence of the cement you desire to use in different cases. In some cases you want it a little thicker, in others a little thinner. Of course, the great disadvantage of this cement is the length of time it takes to harden. You generally have to keep the patient waiting for about an hour with the mouth dry, before it is safe to let him go. It hardens very slowly.

Dr. R. OTTOLENGUI. I want to say about acetone cement something that Dr. Rhein does not seem to have said in his paper; that is, it is not nearly so easy to manipulate as one might imagine. It sets exceedingly slowly, which adds a great deal to the difficulty of using it. In my hands, I have had a patient sit an hour or longer, and even then I found the cement in an exceedingly cartilaginous condition; it is rarely firm even after that time. After the patient is dismissed (this, of course, is an admission of my

faulty technique) he comes back again. It gets hard, and the edges are irritating to the mucous membrane of the lip and tongue. It seems to me there is something lacking in the paper as to the technique and management of this cement. Dr. Rhein has probably found an easy way of using it that we have not found, so that when it is hard it is comfortable and smooth. I have abandoned the practice on that account, because I have not been able to master it. I bring up that point not as a criticism of the method, but as a suggestion to the essayist in closing to give us a little more information on that particular point, and I expose my ignorance for the benefit of the rest of you who may try it and find yourselves in the same position.

The splinting of teeth by using pins in their roots is an advance, I think, by Dr. Rhein on splinting the teeth along the masticating edges. Very often the lower teeth are thin at the edges, and splinting them there makes the strain exceedingly great; although I have seen some very beautiful cases, I have also seen some which have become loosened. It is evident that with this method they cannot become loose. The splint properly adjusted will hold those teeth until they drop out or become well, and I think they *will* hold until they get well if the proper treatment be given. It requires courage, of course, to remove the pulps from all those teeth. That is the principal advantage of the method—to be compelled to take out the pulps. I have come to the decided conclusion that the treatment of pyorrheal teeth without taking out the pulps is simply temporary work. It is simply putting medicine on the patient's gums hoping for results. I ask those gentlemen who do that to try this method. Why not take out some of the pulps and see what the results are?

I will relate one case of this kind, to show the possibilities. A gentleman came to me about three and a half years ago with a canine tooth so loose that he could have removed it with his fingers. This was not a case of pyorrhea, but the man was old and there had been a recession of the gum tissue to such an extent that

there was extensive absorption. It looked hopeless, and it was so in a certain sense of the word. He was very anxious to have it saved. I removed the pulp of that tooth and used temporary ligatures on it for about six months. With treatment, the tooth so far recovered that for over two years (and I see the man once a month) there has been no pus discharging around the tooth. I do not claim that the tooth has become firm, but from his standpoint he has been more than repaid, because, while it is not very useful, it is exceedingly ornamental. It fills the gap and avoids the necessity of having an artificial substitute. The main thing that was done in that case was the removal of the pulp in that tooth according to Dr. Rhein's theory that you thus get the nutrition to the pericementum that would otherwise go to the useless pulp.

Dr. R. R. ANDREWS, Cambridge. I desire to confirm what has been said about devitalizing pulps in such cases. I think we are too timid. Sometimes you will be surprised at the result. I have enjoyed the paper and the ingenious methods presented by Dr. Rhein exceedingly. I think I shall adopt them in some of my own cases.

Dr. C. A. BRACKETT, Newport. I would like to ask if the essayist and the last speaker but one would hold it justifiable to follow such procedure in the case of a single tooth deeply affected with pyorrhea—pyorrhea not only in that tooth, but in the two contiguous teeth—for the sake of using this method?

Dr. A. L. SWIFT. My experience has probably not been as extended as that of the gentlemen who have just spoken. I have had some little experience in these pyorrhea cases, where I have had wonderful results in retaining loosened teeth by fixation, having preserved the pulps alive, and I still have those cases under cognizance. The teeth are as firm as I could have expected them to be, and the pulps are alive in all cases. I do not doubt that there may be cases where I should feel it wise to destroy the pulp, if by that means I might make a splint, as Dr Rhein suggested, but I would take

positive exception to the statement that it was absolutely necessary to remove the pulps of those teeth in order to cure them.

Dr. W. M. DAILEY. I have had a number of cases of pyorrhea—some of those wandering cases. One patient had two pulps removed about a year and a half ago. The teeth were all looser than natural, especially the lower six anterior teeth. To-day every tooth in the mouth is as firm as it should be, excepting the dead teeth. The theory that pulpless teeth are going to take root again, due to the increased blood supply, is hard for me to accept. I might cite a number of cases where I have removed the pulps of teeth and have not achieved the desired results.

Dr. S. L. GOLDSMITH. I certainly can indorse everything that Dr. Rhein has said. The fixtures he makes are beautiful, and in the cases where they are justified I think there is nothing better. Dr. Rhein criticizes the placing of bands around the cutting edges of the teeth to hold them in place. I think the placing of a number of bands united around the cutting surfaces of teeth to be not only permissible but called for in many cases. I have a patient who has worn a splint of the kind I described since 1894. He has not worn the same one, I admit; it has since been renewed—because they do occasionally break. The gentleman was not allowed by his physician to sit in the chair for more than forty-five minutes. To put in a fixture of the kind described under such circumstances would be out of the question. There may be other cases, in which the patient may be an invalid or may not desire or be able to endure long sittings, and I think that in such cases the placing of united bands, when they are made to fit as well as the circumstances will permit, is the best method to follow. Take out the pulps, of course; I quite agree with that point. I believe the treatment of pyorrheal cases includes the removal of the pulps.

Dr. E. GAYLORD, New Haven. I am very happy to have heard the paper, to which I have listened with much interest.

While I am not in a position to discuss it, yet knowing the ability of the essayist I should be inclined to indorse almost anything he might suggest. I noticed, in the models he passed, three contiguous teeth attached by the staples. Do I understand that gold fillings are to be placed in those teeth? I also understand that those teeth are loose.

Dr. RHEIN. I feel very thankful for the discussion that has been elicited, especially for the kind words of approval that I have heard from some of my friends. In reply to the first question that was put, in regard to whether I should deem it justifiable, if we had one very loosened pyorrheal tooth, to remove the pulps of the contiguous teeth, I would say that fifteen years ago I would have found myself in the position of Dr. Dailey and Dr. Swift on this question, and would not; but to-day I say decidedly, Yes. I say it for this reason—without taking the time to go at length into it:

In all such cases it is supposed we are speaking of the ordinary pyorrheal cases, which occur generally in middle life—past the age of thirty-five or forty years—at an age when we know the pulp has practically accomplished the work for which it was intended. The benefit we derive is not confined to the fact that we are retaining a useful tooth in this way. If the gentlemen present have paid any attention to the work done in the past two years by the Stomatological Section of the American Medical Association, they will have noticed that in that section some very scientific and valuable work on the question of the pulp is being accomplished at the present time. Dr. Andrews, who was present at the last session, knows that the point that was most forcibly brought out was the rarity with which we find normal physiological pulps, as we understand the term, at any age after twenty. When I make that statement I have due regard for the natural diminution of the size of the pulp as age progresses. The microscopic work done in that direction has brought out the fact that the interior of these pulps, the constituent parts of the pulp tissue

itself, show almost universally pathological conditions. That means they are subject to more or less trouble in the mouth. Time does not permit me to say what I would like to say regarding the different kinds of diseases we meet with, from alveolar abscess down to pulp-nodules in the pulps themselves, all of which we are more liable to find in pyorrheal conditions than in a person in good health.

This is also meant to reply to the remarks of Dr. Swift and Dr. Dailey. It is a question that scientifically the American Medical Association is hard at work upon, and it is to be hoped they will so lay the matter before the profession that we may understand consistently why it is advisable to remove pulps in these cases. I admit that there are cases where it is not called for. I do not want it understood that I advocate the removal of the pulp in every case of loosened teeth, but in the large majority of cases no harm can be done. I wish I had the time to go into details and show you conditions where at the age of fifty a pulp-canal, instead of diminishing in caliber, as it should normally do, is in the same state and of the same size as at the age of fifteen. Sometimes we find that in pyorrheal cases, and then the health of the peridental tissues is very much affected.

Dr. DAILEY. Will you explain why it is that the teeth in which there are living pulps often get well and the pulpless teeth still continue to be loose and discharging pus?

Dr. RHEIN. In treating pathological conditions of this kind, each case is a case by itself and a law unto itself. I have myself at present a case to illustrate what Dr. Dailey says, where I have removed the pulps from three teeth. That is only an initial part of the operation I intended for this patient. The remaining portion of the work means the splinting of the teeth in order to get them into a proper condition. Without that, I look upon the removal of the pulp as absurd in the case in question. It would be a waste of time and money. It is my custom to practice upon such a basis that I ascertain whether my pa-

tients are satisfied with my fees, and, if they are not, I believe it is as well to sever connections at once, and I send them a statement at the end of each month. The patient considered my fees too high, and so I could not complete the case. Now, Dr. Dailey may say that Dr. Rhein removed those three pulps and they are the worst teeth in the mouth. That is a condition that may present itself, and I would consider it folly to take out those pulps and leave them in that condition.

Talking to Dr. Swift, in regard to what I think is passing through his mind at this moment, as to the case of fifteen years ago that I spoke of at the beginning of my paper: I preserved those teeth for ten years by splinting without removing the pulps, but I ultimately lost the teeth from an advance of the peridental invasion. The patient was gouty and there was such a lack of nutrition that I realized too late the error of omission in that case. I am firmly convinced that those teeth I splinted in 1888 (where the patient wears a denture to-day) would still be in position if the pulps had been removed.

In regard to Dr. Goldsmith, I want to say that I differ entirely with him as to the banding of front teeth together in this way. Our dear friend Dr. Perry has spoken so often on that matter—of the display of gold in the front of the mouth. We see so much of it under the plea of treating pyorrhea, putting gold rings around those teeth and banding them. For that reason I am showing the model of the case [see Fig. 11, page 372 of this issue of the *Cosmos*], to indicate how the temporary splinting of teeth could be done by means of pure silver wire covered with a cement made of celluloid and braced on either side by little buttons of Harvard oxyphosphate of zinc (the value of which came directly to me from Dr. Perry's associate, Dr. Tracy) to prevent the splint from working its way up on the gum. That is infinitely superior to the kind Dr. Goldsmith advised, because it is cleanly (the celluloid leaves a smooth, polished surface), and it does not disfigure the mouth.

Dr. GOLDSMITH. You forgot to state

that the question of esthetic appearance in a man who has a valvular disease of the heart and who cannot go out is not of much importance.

Dr. RHEIN. Discussing it from another point, it is much less difficult to place ligatures of silver wire around the teeth than to cement bands around them.

I am sorry Dr. Ottolengui was called away and that he cannot listen to my answer to his question. The celluloid cement is a thing that can be found in a very bad condition and in a very good condition, and you must experiment with it to some extent. He spoke of leaving the patient an hour, returning to find the cement in a cartilaginous condition, and having the patient subsequently come back with hard, sharpened points. I am satisfied if I can find it in a cartilaginous state at the end of an hour, because it will come back hard. When it is cartilaginous, it is sufficiently hard to dismiss the patient. It will not lose its shape after that. If it has been placed in a proper position it is safe to harden by itself.

I have myself made a mixture of celluloid and acetone and used it ten or fifteen times, adding fresh acetone each time. At the end I had a very poor cement compared with what I should have had if I had taken fresh celluloid and fresh acetone each time. If you will do that and mix enough oxid of tin with it to get a proper base, it is easily manipulated and requires but little experimental work. It is not necessary to make it harder than a cartilaginous state. It is then safe to send the patient away.

Dr. Gaylord asked whether I intend to fill the three lower teeth with gold. The intention was to finish it in the same manner as the operation described, using the same technique, showing how that could be done as beautifully as a gold filling.

Evening Session.

The president, Dr. Hodson, called the meeting to order.

Dr. HODSON. We are deeply gratified to see the large representation of gentle-

men from outside New York who are honoring us by their presence to-night. You are very cordially welcome to our anniversary meeting, and I personally desire that you consider this meeting your own, feeling as much at home as you would in your home societies. We would be pleased to hear all your voices. In consequence of the fullness of the program we will omit the usual reading of the minutes and proceed at once to the paper of the evening.

Dr. W. W. WALKER. Mr. President, before the reading of the paper of the evening, may I be allowed a few moments? [Granted.]

I do not know why it is that when misfortune overtakes any member of the dental profession, I am always approached. Recently, within a day or two, a matter was brought to my notice which I feel it my duty to bring up to-night. Our constitution makes no provision whereby we may take money from our treasury to give to a cause of this kind. I spoke of the matter to two or three of the oldest members and they agreed that this was the place to consider it. It is a very sad thing for me to do this, but I feel it a duty.

A week ago Monday, the last daughter of our dear old friend and lamented brother, Dr. Atkinson, died in New Jersey, without a penny. I have here a bill for her burial expenses, which should be paid, and paid at once. These matters were sent to me, and I ask you, as members of the Odontological Society, what ought we to do in this case? What did dear old Dr. Atkinson do for us? And to think that after all the years he worked so hard, and attended so many meetings, that his daughter should die without a dollar. I think something should be done whereby this debt should be liquidated.

Dr. CARR. I do not think there is any gentleman who knew Dr. Atkinson during his lifetime but knew of his generosity. No one ever went to his home for pecuniary aid who was not assisted freely, if the doctor had money. If anyone went there for professional advice he also

received freely, and I think, in memory of Dr. Atkinson, that we should provide for this bill. We freely received; let us freely give. I will take my hat and take up a collection for the cause.

The PRESIDENT. I think Dr. Walker should also pass around the hat.

Dr. JARVIE. While the hat is being passed, may I say a word? Dr. Atkinson was not identified with the New York Odontological Society alone. If any man was owned by the dental profession at large, it was Dr. Atkinson; and I think it is very proper that at this meeting, at which there are dentists from all over the country, this appeal should be made. You may say that it is not to pay an indebtedness incurred by Dr. Atkinson; but this daughter was his favorite child, and I think if Dr. Atkinson could be present to-night and look down upon this gathering, it would touch his heart to think we were thus paying for the last rites that could be done on earth for this his favorite daughter.

The paper of the evening was then read by Dr. E. C. KIRK of Philadelphia, entitled, "The Structural Characteristics of Calcified Dental Tissues, as Related to the Question of So-called 'Hard' and 'Soft' Teeth," illustrated by the use of the projecting micro-polariscope. (Printed in full at page 345 of the current issue of the DENTAL COSMOS.

Discussion.

Dr. R. R. ANDREWS, Cambridge. I do not know why you should honor me thus, by calling upon me to open the discussion of this paper. I must first heartily congratulate Professor Kirk on his magnificent demonstration. These pictures show an appearance of a structure which I confess I do not clearly understand. I have seldom used the polariscope in my work, consequently I am somewhat of a stranger to its interpretations.

In an histological way, I have investigated dental structures for over thirty years, and in this investigation I have been particularly interested in that substance which we call calcoglobulin, and also in the formation of the calcified

structures of the tooth from calcospheroids, the minute globules which have their origin in the blood supply, which pass through the cytoplasm of the odontoblast to form the dentin, of the ameloblast to form the enamel, and of the cementoblast to form the cementum. In the specimen so beautifully shown to-night with the polariscope, we see what Dr. Kirk has called calcoglobulin, but what is really calcified calcoglobulin. For calcoglobulin itself is a transition tissue between an organic and an inorganic substance. The sheaths of Neumann, surrounding the dental fibers in the dental canals, are of the substance we know to be calcoglobulin. That is, they are a transition tissue which, by some further stage in the calcifying process, may become a part of the calcified matrix. In the specimen shown we saw large globular masses within a mass of calcified new formation. If there had been enough of the calcospherites which form the globules to fill the whole mass of the new formation we should have had simply a mass of normally calcified tissue which would not have had this globular appearance. In my judgment there was a lack of globular matter—or, in other words, an arrested state of development in forming this dental excrescence, which although calcified was not a normal calcification. And it is this lack of perfect affinity, or rather perhaps of perfect coalescence, that gives imperfect tooth-structure. I have studied many specimens of this imperfect development where the tissues showed large globules being calcified within the substance of the dentin. The picture on the screen to-night showed us one of these globular formations in the pulp-chamber of a tooth caused by some outside irritation.

I wish I were better able to speak on this new phase of research work. It may have great possibilities and may be a valuable method of learning more about the structures of the dental tissues. In regard to the views of Dr. Black, I am on record as one having a good deal of faith in the vital principle. We must remember that his experiments were made on dead tissue and out of the

mouth; and although the conclusions are valuable, no conclusions can be exact when experiments are made with dead tissue. I think a mistake is made when we leave out the question of vitality and its possibilities. We saw in the specimen shown to-night how the vital principle acts in protecting the pulp against the inroads of decay. You saw that the odontoblasts had formed new tissue against the tissue which had been destroyed. The value of this vital power is shown me—living as I do in a university town—when students are all run down from over-study. Not only the fluids of the mouth become abnormal, but the whole system, with the teeth decaying rapidly. Give these students a rest, away from their work, for awhile, and they come back in an entirely different condition; their vital power returns and the teeth cease to decay.

There is a wonderful power in this vital action. We see this vital power displayed by the dental canals which open into the cavity when they are filled by the slightly irritating cements which are adhesive. In the course of time you will find that the open ends of these canals have become calcified. Dr. Black states that they become filled with fat-globules. I believe they are filled with calcospherites which may become caloglobulin and calcify.

I recently saw a case, where a patient some years ago had a tooth filled with an oxyphosphate filling. The filling wore away and left the cavity open, and it had been open for a year. There was no decay there, although in other parts of the mouth teeth were decaying. The secretions and the environment were the same; the vital power had sealed the canals in this cavity. That condition had been brought about which Robert Arthur spoke of when he polished off the decayed surface of the enamel and the dentin and kept them clean and polished until a changed condition of the surface took place. Dr. Arthur, in his practice, claims to have been successful in treating teeth in this way. Many others were not, but there is no doubt whatever that a change of this kind takes place through

vital action. And this vital action is of very great value, it seems to me.

I wish I were better able to discuss the beautiful specimens shown on the screen by the polariscope. I have never given the polariscope the study it deserves in my investigations on the human teeth. I hope in the future to be able to say more about it.

Dr. T. C. STELLWAGEN, Philadelphia. I surely voice the sentiment of this assemblage in saying that we are deeply indebted to Professor Kirk for this demonstration, which has opened the door to a vast field of study, and likewise we are grateful to this society for giving us such a glorious opportunity to see these illustrations. It delights me for many reasons. It is not so many years ago that I made the assertion that if we only understood the teeth properly and thoroughly we could read the entire history of the animal. Upon every organ of the body, at the time of its formation, there is an impression made that is independent of the others and yet is in harmony with the rest of the body. In sickness—particularly in certain diseases where the skin is affected, as in the major exanthemata—it has long been recognized that the locations of the pittings of the enamel correspond with the age at which the malady occurred, due to defective deposition. It is probable that there may also be degenerate deposits in the dentin, but no clearer demonstration of the defective work of the ameloblasts and odontoblasts—these workmen, if you please—has been offered than in these sections shown by Professor Kirk. It looks as if the cells of the body had periods of good or bad health during their development and operation. Just as a mechanic, when he is suffering from malaise or some malady, does not perform his work as well as when enjoying good health, so these cells may be interfered with in the performance of their functions.

It may not be proper for me to speak of matters which Dr. Kirk has under consideration, which shortly will be presented by him in Chicago; but his work on saliva is another illustration of the

results of disturbance of cell-function possibly more pronounced than what we have here to-night. We find it occurring not only in the saliva, but wherever epithelia functionate. Where a substance is either transuded or directly secreted through an epithelium the result will differ in direct ratio from its normal characteristics as the epithelium has departed from the normal. It is known that urine excreted through the kidneys varies much according to the state of the epithelial cells lining their tubules. In like manner it is assumed that the epithelium covering the villi subjects the peptones in the chyme to changes which prevent the poisoning resulting if they are injected directly into the blood.

Professor Kirk has demonstrated very satisfactorily indeed that there is a like condition, or at all events a change in the saliva, in accordance with certain abnormalities of the salivary glands or of the blood which transports the nourishment to them. So wherever there is protoplasm, the living active principle, governor of the cells, may reflect its condition in the cells' functions. It is perhaps a little hasty to suggest it, but, as the brain and nervous system control the body at large, may not the nucleus and the protoplasm of the cell act somewhat on the same order? When protoplasm is normal, does the cell do its work properly, and *vice versa*? These demonstrations indicate not only that the deposition varies, etc., but from them we may deduce a reason why the variations take place—that is, because of the fluctuations in the condition of the protoplasm of the ameloblasts or the odontoblasts and the cementoblasts.

We could go still farther on this line, but it might be ruled as slightly out of order. Permit me to thank you, Mr. President, and gentlemen of the society, for suffering this digression to compare the working of protoplasm as we find it in epithelia and as we find it in the tooth-builders, which are closely related to the cells of the epithelia.

Dr. DARBY, Philadelphia. I thank you, Mr. President, for calling on me. I have nothing to say on this subject.

What Dr. Kirk has said he has said so beautifully and so well that I am sure I could add nothing to it. I have been immensely interested in this work. Being neighbors, Dr. Kirk has been kind enough to show me the various stages of his experimentation and his work. He has shown most beautifully those changes which take place in the pulp itself—the calcification of the pulp, forming pulpstones.

Dr. C. A. BRACKETT, Newport. I can only express my sense of regret that in my earlier student years the opportunities for gaining histological knowledge were not like the opportunities of the present, and my congratulations especially for the young men who are now students in our schools, and my anticipations for the future, that are quite beyond anything yet realized.

Dr. ASHLEY FAUGHT, Philadelphia. I have been intensely interested in Dr. Kirk's paper and his work. He has most beautifully brought out the illustration of the fact that the arrangement of the particles has much to do with the question of hard and soft teeth. I have been particularly pleased and interested in Dr. Andrews' remark calling attention to the vital powers, the teeth as we understand them when we operate upon them, and the clinical aspect when they are *in situ*. These things must be recognized as potent factors in relation to "hard" and "soft" teeth. I have always felt that they did vary in relation to the vital power. I appreciate that the work which Dr. Kirk has presented to us in so lucid a manner will be a great help to us.

Dr. S. G. PERRY, New York. I would not for a moment presume to speak upon the subject of the paper, but I cannot let the opportunity pass without adding my appreciation of the advantage to this society of hearing such a paper. If there is anyone present who has any thought that the dental profession is retrograding in any way, I think he has only to hear the paper and see the faces of those present; and, above all, to have been present this afternoon.

I am an optimist through and through, and I think we are to-day in advance of

any position we have ever held. I congratulate you, gentlemen, from the bottom of my heart.

Dr. R. OTTOLENGUI. Mr. President, I am very sorry to have been called on, because I am not a chemist, and so cannot speak on this subject. I have enjoyed exceedingly once more one of those classic papers that we may always expect when Dr. Kirk's name is upon the program.

Dr. KIRK. I have nothing to add to the presentation of the subject that was given in the paper, farther than to say that this is all in an experimental stage. I have only offered it to you as something suggestive. I believe there is a difference of some sort in teeth, and the kind of difference that has made the clinician talk about "hard" and "soft" teeth, "poorly calcified" teeth and "well calcified" teeth, etc. It does not pay to ignore what the clinician says, or to say that it does not mean anything as measured by the standard of laboratory practice. That is unsafe. We have had indications throughout the dental profession that there is a difference in tooth-structure and in teeth; the clinician may not have been able to express it in scientific terms, but he knows it is there. I do not believe Dr. Black has said in any of his researches that it is not there, but he has forced us to a point where we can express what we mean. I ran across this thing somewhat accidentally one evening, and I want to offer it as a means of research and study which will help to bridge over the difference as to what the dental profession as a whole, and the clinicians, have been trying to express, and what Dr. Black has been trying to express as the result of his laboratory research. I brought it to you in a raw, crude manner, and merely as a word of

encouragement,—so we may wind up our little argument in the words of one of the characters of the "Mikado":

"You are right, and I am right, and everything is right."

All the compliments that have been given are very gratifying. In that relation I am somewhat in the position of the bashful young man who plucked up courage enough to kiss his best girl and then begged her not to say anything about it; and she said, "Well, you need not worry about that, because I am just as much ashamed of it as you are."

Dr. WALKER. You will remember that a year ago to-night, I made a remark that if the officers and the Executive Committee and the Clinic Committee would work hard they would have even a finer meeting to-night than we had then. They have done their work nobly, and I want to offer a motion for a vote of thanks to the gentlemen who gave the clinics and to Dr. Kirk who gave us such a delightful paper, and to express the hope that you will all be with us next year.

The motion was unanimously carried.

Dr. WALKER. I want to say that there has been collected \$135, which will be a little more than is necessary, to defray the expenses of this bill. The day before Dr. Atkinson's daughter died she made a request of her brother that she be buried beside her father in Woodlawn. She has been buried there, and the little excess of money given to-night will go toward keeping their graves green for two or three years.

There being no further business, the meeting adjourned to the banquet hall, where a collation was served.

ELLISON HILLYER, D.D.S.,

Editor N. Y. Odont. Soc.

NORTHEASTERN DENTAL ASSOCIATION.

Eighth Annual Convention.

THE eighth annual convention of the Northeastern Dental Association was held at Worcester, Mass., on October 15, 16, and 17, 1902.

The morning of Wednesday, October 15th, was occupied with routine business.

WEDNESDAY—*Afternoon Session.*

The afternoon session was called to order by the president at 2.30 o'clock; the vice-president, Dr. E. B. Griffith, Bridgeport, Conn., took the chair, and the president then read his address.

The subject was passed, and Dr. J. TAKAMINE, of Tokio, Japan, read the following paper:

A NEW HEMOSTATIC.

I feel highly honored in having the privilege of coming before such a distinguished body, and I also take it quite a compliment paid by you to my country to invite me to speak before you to-day.

Quite likely the "new hemostatic" which I am going to present before you may be already known to some of you, but from its being of as much interest to the dental profession as to the medical, I venture to describe briefly its important characteristics.

This new agent, which I term *adrenalin*, is the basic form of the active principle of the suprarenal glands. Over forty-seven years ago Addison first observed the change that takes place in the suprarenal glands and their relationship to a disease with which his name is now associated. Oliver and Schaefer discovered that the extract of the suprarenal glands, when injected into the bloodvessels of animals, produced remarkable increase in blood pressure. Many physiologists, chemists, and others took up this interesting subject, and the results of their studies show that this gland bears the same relation to the heart

and blood-circulating system that the Watt governor bears to the steam-engine or pump. Further investigations have shown that there is a certain chemical constituent in the suprarenal glands that performs this wonderful work in regulating the blood-circulating system.

Naturally a good many chemists tried to isolate this remarkable active principle, but without success, for a good many years. Fortunately, about two years ago I was able to isolate the basic constituent of this active principle in a crystalline form, a thing which had never been done before.

The crystalline substance thus obtained has remarkable physiological properties; for instance, if one part of the crystals be dissolved in one hundred thousand parts of water, and 1 c.c. of such diluted solution be injected into the bloodvessels of a dog, within a few seconds the blood pressure will rise to the extent of 14 to 15 mm. A drop of adrenalin solution or its salts in the strength of 1:10,000 dropped into an eye blanches normal conjunctiva within one minute. Therapeutic applications of adrenalin are already numerous, and new uses for it are constantly found by investigators. Generally speaking, the adrenalin when locally applied is the most powerful astringent and hemostatic known. It is useful to the dentist in hemorrhage after the extraction of teeth. If it be applied in the strength between 1:1000 and 1:10,000 it is useful to subdue the inflamed or irritated gum. By applying it on a piece of cotton it will be noticed that the red, inflamed gums turn white, showing that the blood has been forced out of the capillary veins, and this condition will remain from fifteen minutes to one hour according to the strength of the solution used and also to the duration of the application. It is

also valuable in the carrying out of the bloodless operations, such as in crowning teeth or in the treatment of pyorrhea, etc.

Another useful property of this agent is its stimulating action on the heart. It is well known that some hearts are very sensitive to the use of cocain. This undesirable effect is counteracted by the use of a small quantity of this adrenalin solution, either before or using it together with cocain. It has produced good results in circulatory failures, for the prevention of collapse in anesthesia, and in allied conditions. It is indicated in the condition produced by morphin and opium poisoning; from a few drops to a few cubic centimeters, taken by the mouth to be absorbed by the mucous membrane, usually give the desired effect.

Adrenalin is a light white micro-crystalline substance, which presents itself in five or six different forms of crystals. It has a slightly bitter taste, leaving a numb feeling on the tongue where it has been touched. It is perfectly stable in dry form, and possesses a slightly alkaline reaction, showing that it is the basic portion of the natural form of the active principle of the glands. It is difficultly soluble in water. It forms various salts with acid, which is a convenient form to use for practical purposes. The solution gives characteristic green coloration with ferric chlorid, and produces a pink to red color with gold chlorid solution. It is a strong reducing agent and may be available for other than medicinal purposes. The crystal is over one thousand times stronger than the original fresh gland.

I believe that the isolation of the active principle of the suprarenal capsules ranks as one of the most important steps in the progress of medical science. The discovery of chloroform, Pasteur's discovery of disease germs, and the discovery of antitoxin are the other great steps of progress in the medical and surgical sciences. The discovery of the active principle of the suprarenal glands will stimulate further discoveries as to the active principles of various other

organs of animal bodies. All the drugs heretofore have been derived from the vegetable and mineral kingdoms. We can readily imagine that if the various active principles of the animal organs be isolated, how simple and yet how efficient the healing art must become.

Discussion.

Dr. D. C. McMAHON, Meridian, Conn. I learned about this preparation last year, and having some patients with a hemorrhagic diathesis I decided to get some of it and try it. I tried it soon after in a case of extraction on one of these hemorrhagic patients, and to my surprise and pleasure I found the operation almost entirely bloodless. I have found this preparation to be of great value in grinding down teeth for crowns. By the application of a small quantity of the drug to the gums, I find that I can proceed to prepare the tooth for a crown and not be troubled with the hemorrhage that is so annoying in cases of this character. As to the doctor's test for the preparation, I have never tried it, as I never had any occasion to do so. I have the drug in the original bottle, and it serves my purpose now as well as when it was first bought. The original label on the bottle says that it is a 1:1000 solution. In cases of patients that are of a hemorrhagic diathesis, when I have wanted to extract teeth I have found this agent most valuable; we all know what anxiety usually accompanies operations on this class of patients. When I want to extract a tooth for one of these patients I simply inject into the gums around the tooth, a few minutes before the operation, a few drops of this agent, and I find that I can extract the tooth with practically no hemorrhage at all.

Dr. H. W. ADAMS, Boston. I have used the solution something like a year in cases of hemorrhage, such as in setting crowns and in the preparation of cavities partly under the gum margins, and I find that it stops the hemorrhage almost instantly and enables one to proceed with this character of work immediately. I

use it where I used to use carbolic acid, etc., and find it more satisfactory, from the fact that the patient is not aware of your using it and that it does not produce a scar. I find the agent very beneficial indeed.

The subject was passed, and some business having been transacted,

The meeting then adjourned until 7 o'clock P.M.

WEDNESDAY—*Evening Session.*

The meeting was called to order by the president, and the society listened to a paper from Dr. JAMES E. POWER, D.D.S., Providence, R. I., on "Errors in Diagnosis." (Printed in full in COSMOS for December 1902, at page 1248.)

Discussion.

Dr. CHAS. C. NELSON, Gloucester. I would like to ask the doctor if, in that last case where he extracted the root of a tooth, there was anything to indicate the presence of the root?

Dr. POWER. No. The gum seemed perfectly normal. So far as the surface was concerned you would not have suspected any evidence of the presence of a root in this region.

Dr. NELSON. The discovery was made, then, from an incision at that point?

Dr. POWER. Yes. But I was governed by the history of the case in making the incision. The patient gave the history of having had a canine tooth broken off, and said that the dentist told her there was a piece left in there, but that it would work down. She told me that later a physician had diagnosed the case as erysipelas, and had treated her for the same without any satisfactory result.

The last case has never been satisfactorily explained in my mind—that is, how the pus reached the sinus in the forehead from the canine tooth. The extraction of the tooth relieved the pain about the eye almost immediately, and the patient was relieved from the headaches, after four years of pain.

Of course we all know that pus flows in the line of least resistance, but how the line of least resistance could be up-

ward and through these bones is what seems difficult of explanation. I have consulted several anatomists and surgeons whose opinions on subjects of this kind may be considered valuable, and of all theories advanced the most plausible one is that the pus passed between the plates of the turbinated bones, through the lacrymal fossa around the corner of the orbit, through the supra-orbital notch, and under the frontal muscle. If this be the case—and it is reasonable to suppose that it is so—the real seat of trouble was sub-dermal, and not sub-osseous.

The patient's history, showing that the last physician who saw her before entering the hospital made an incision and found pus, would to a certain degree verify this theory.

Dr. C. FONES, Bridgeport. Probably some here remember Dr. Bartholomew of Springfield. This case reminds me of one related by him at the old Connecticut Valley Dental Society. He said that a lady patient of his had been treated by a physician for cancer for some time, and feeling an interest in the lady's condition, he went to see her. He asked her about the cancer and where it was. She told him it was in her breast, and showed it to him. After examining it, he said: "Do you remember the wisdom tooth I extracted for you some time ago?" She said "Yes." "Well," he said, "there is a small piece of that tooth still in your mouth that I failed to get out, and if you will come to my office and let me remove it, I think I can cure that cancer." She went to his office, the remainder of the tooth was extracted, and the cancer was soon cured.

The subject was passed and Dr. B. J. CIGRAND, of Chicago, Ill., read a paper on "Gnathic Movements and Philosophy of Mastication Relative to Prosthesis."

The association then listened to Dr. CHAS. H. GERRISH, Exeter, N. H., on the topic "Practical Hints," as follows:

PRACTICAL HINTS.

Dr. Bliven has paid me a very unique compliment, and I cannot recall what I

have done that he should treat me in this way. I promised Dr. Bliven last year that if he were elected president for this meeting I would be present and do something for the meeting as a personal favor to him. So I am here and ready to discharge my duty, and I have no apologies to offer for what I am going to say. I am not a scientific man, as you all know, and what I say will not be along scientific lines, and it will be especially for the young men of the profession. As to the older members I have no hope or desire to change their methods of practice and their habits. I must admit not having ever been the student that possibly I should have been. I have never read a great deal; I have devoted most of my time to saving teeth instead of reading about it.

Now, I have not a regular prepared paper, but decided to give a talk along the line of practice that I have tried to follow for several years. Should my talk seem rambling and disconnected you will pardon me, as I want to give the young men some practical points that I have picked up with regard to the office.

We take it for granted that when the young practitioner starts out he has a laboratory, operating room, and reception room. We will start with the laboratory.

One of the most important adjuncts to the laboratory is old soap. Get some plain Indian corn meal and some old toilet soap—the older the better. These two used together will keep the hands in as nice and soft condition as any preparation you can use. Buy a high grade of soap and be sure that it is old. Your dealer will sell this to you for about half price. It is a bad plan to use just any kind of soap on the hands. Get a high grade of old soap, and this in combination with Indian corn meal will keep your hands as nice as possible.

The next thing in the laboratory is modeling compound and wax. After you have used a piece of old modeling compound for about twenty years it will take a better, sharper impression than anything I know of. This was my idea of it until I went to make a set of teeth for myself. I looked at that old piece

of modeling compound, and I said to myself, Can you put that in your mouth? I decided I could not, so I got a new piece for my own mouth, and since then I have not put in my patient's mouth what I would not put in my own. And that is a good golden rule for the dental office: Never put in your patient's mouth anything you would not put in your own.

Another thing for the laboratory is to have a fairly dull pocket knife for plaster work. Be sure you have it dull. It won't cut plaster much, but it certainly will not cut your hand. It is not a good plan to have two knives in the laboratory, because if you lose them it takes longer to find two than one. The other principal adjuncts to the laboratory are second-hand shoes and old clothes, but these will come after you have sufficient experience.

As to the reception room, that will depend entirely upon your individual taste and preference. My only advice is not to furnish it too elaborately with pictures, fancy furniture, etc. Of course you want to have sufficient chairs to accommodate your patients, but that won't take many—at first, anyway. One or two pictures will complete the reception room. In my reception room I have one picture, a hunting scene, an advertisement of some cartridge company.

Now as to the office. One of the most important questions I will ask this morning is, How does your office smell? Now, that may sound ludicrous, but I have found in dental offices all smells, from that of coal gas to creasote. I think, however, that coal gas is the worst of the two. Now, this is a very important point to look after; it always makes an impression on the patient. You will find it a good plan to have a fire in your office every day, winter and summer. I have an open grate, and am fortunate enough to be where I can burn wood, and I have a small fire every morning for an hour or so during the summer, and of course I have a good fire all day during the winter. I find that this has a great deal to do with the different smells in the office. If you will follow this plan, and have plenty of ventilation, you will find

that your office will smell nice and sweet all the year round.

The next question I want to ask is, How do *you* smell? Some will answer, I smell like anybody else. No, you don't. No two people smell alike. For instance, when a person is lost, or if for any reason they need to be traced by bloodhounds, some article of wearing apparel of the one to be traced is given to the dog to smell, and he will trace that smell to the owner. Your hunting-dog can trace you any time, and will take your track, and nobody else's, for the simple reason that he knows your smell. See to it, then, that you make every effort to keep absolutely clean. Many men make the mistake of changing their collar when they should change their underwear.

Another thing you are entitled to, and that is a breath, and if you happen to wear a bridge or a plate, you are liable to have two. This should be looked after very carefully. You should use every means to have a good clean breath. A good aromatic wash with tooth-powder and plenty of water will give you a fairly clean breath.

A word with regard to the care of the hands. You should be very careful to wash the hands as often as possible. By all means you should wash them after dismissing a patient, and it is often necessary during a long operation; for instance, while you are operating on one patient and another comes in and asks for an appointment, which necessitates your examining their teeth, you should be sure to wash your hands before the examination and again before proceeding with the regular operation. And in this connection I would caution you not to take any instruments from the table where you are operating on one patient with which to examine the mouth of another; have your examining instruments separate. Let what is on the table be sacred to the patient that is in the chair. Another occasion when it is proper to wash your hands is when you blow your nose while operating on a patient. This may seem ludicrous, but as a matter of fact—as noses run—yours is no better than anybody else's.

Now with regard to the care of your instruments. It has always been my custom to keep a small glass filled with listerine on my table to put my instruments in while using them. As to its being a powerful antiseptic I do not know. I use it in this way simply as a matter of cleanliness. For antiseptic purposes I depend on alcohol and fire.

* I have spoken of cleanliness of the body; now I might add a word in regard to the necessity of a *clean mind*. When you are working over a patient let your thoughts be pure and clean, and you will never regret it.

As to the *instruments* you use, I would caution you to use one instrument enough to be able to manipulate it easily. The principal instruments you will need are chisels, excavators, scalers, and scoops. Of these I would especially call your attention to the use of the chisel. It is one of the most valuable instruments when used properly, but when not so used is one of the greatest evils. Many are substituting the engine for the chisel, which I think is a very bad idea, as it is impossible to get as good enamel margins with the engine as with the chisel, and I would especially emphasize the value of the chisel in the preparation of cavities. I would advise against the display of instruments on your table, especially to nervous patients. Do not allow any more instruments on the table than are absolutely necessary for the operation, and be sure to have these clean. A little alcohol rubbed on them will keep them absolutely clean. As to pluggers, use one long enough to learn how to use it. The great variety of tools, with the diversity of forms, are not made by the manufacturers for those who know how to work, but for those who don't know how to use any tools at all. In plastic work take the single-end plugger, and when you have finished your filling and are looking around for some instrument to burnish it with, take the ball end of the plugger and you can put as good a finish on it as with any of the burnishers.

Engines and rubber dam. The dental engine is the invention of the devil, and

it is used by many dentists in a fiendish way. I have seen men use the engine in such a way that a tooth would smoke and smell from the friction caused by the bur. Such a man ought to have a tooth filled every morning before breakfast. Use a dental engine with a firm hand, and let up occasionally. Think of the teeth as something human, as they have a good deal of feeling. When you use instruments use them with a firm hand, and let up occasionally. I have only one remark to make with regard to rubber dam; use it once and then throw it away; don't wash it off and use it again.

Filling materials. I will speak only of the three that have proved the most beneficial in my hands: gold, gutta-percha and tin. Gutta-percha makes a foul-smelling filling and the worst of any to finish up, but there is no doubt in my mind that it is the best preserver of any of the filling materials used to-day. I have taken out some of the foulest-smelling and most miserable-looking fillings, and found the tooth-structure in perfect condition. An old gutta-percha filling smells bad and looks bad, but it saves the tooth-structure.

Tin. I use tin a great deal, and have had some good results from its use. I find that it is very excellent as a preserver of tooth-structure. I find many cases where I can use tin to better advantage than any other material, but I do not use tin as much as non-cohesive gold.

Non-cohesive gold. This is my hobby. I have worked with this material for forty years; I have done some good work and some bad with it, but I stand before you to-day and say that I believe that there is no filling material of gold that will preserve a tooth as well as non-cohesive gold foil. A great deal, however, depends on the operator. Now, Dr. Bliven and many others can make a perfect filling of cohesive foil, and they are great advocates of that material. Its success is due to the merits of the operator and not so much to the material. I believe, though, that with non-cohesive foil, when you have the angles of the cavity properly prepared, and when it is

finished and burnished properly, you have a filling that is as mechanically and chemically perfect as it is possible to make with any material. But every step of your work has to be thorough if you expect a perfect filling. If the filling is imperfect in any one step it is going to fail. It is like a ship going to sea with one leak; it is going to sink. Your operation has to be absolutely perfect in every step if you would hope for success.

I would like to say more on the subject of non-cohesive gold, but will close with a few remarks on cleanliness of the teeth.

Your patient's teeth are clean or not as you make them. I have always emphasized the necessity of keeping the teeth clean to all my patients, and I set the example to them by cleaning them every time I work on their teeth. When I finish filling my patient's teeth I stop and clean them, and they have gotten to where they expect it. There is no question as to whether they want them cleaned or not; it is absolutely understood that I am going to clean them. And I would say to the young men of the profession to-day, Let that be your keystone in the arch of dentistry. I believe that as much can be done in this way as in any other. Care should be taken to see that every tooth is perfectly clean and polished. I have spent, many times, twenty minutes in polishing a single tooth, and it was the salvation of that tooth. I wish to especially emphasize this part of the work to the young men, and if they will pay the proper attention to it there will be less necessity for the extensive bridge work that we so often see. It is very beautiful mechanical work, and is good for the patient, but the best thing is to make an effort to obviate the necessity for it.

Discussion.

The PRESIDENT. You are all aware, after what Dr. Gerrish has said about soft and cohesive gold, that we do not always agree. I have a large compound cavity which needs attention, and I desire to have Dr. Gerrish fill the tooth for me according to his method. Perhaps we will better agree with regard

to the different kinds of foil after he has performed the operation.

Dr. G. P. WIKSELL, Boston. I guess we will always have controversy between the soft and hard gold men. Some time ago a lawyer was in my chair, and I noticed beautifully knuckling approximal bicuspid and molar fillings, with the cervical margins well under the gum, and as clean and pretty as if they had been put there only a week before. After examining them, I told the gentleman that I could tell him who did that work. He said he had forgotten the man, but that it had been done about twenty years ago, he believed in Worcester, but he had forgotten the man's name. I told him it was Dr. Bliven, and he immediately recognized the name, and said, "Yes, he was the man." I recognized the work as I would have recognized my own, and I know that Dr. Bliven does some excellent work of this kind; but I venture to say that he will agree with me when I say that I believe if we had a school with Professor Bliven and Professor Gerrish teaching us their different methods of filling teeth, Dr. Gerrish would have more pupils that could save teeth than would Dr. Bliven. I do not mean by that that Dr. Bliven does not save teeth, for he does, and he is a splendid operator, but the point is that hardly more than a few, I believe, could ever attain the degree of proficiency of Dr. Bliven.

Dr. C. H. MERRITT, Auburn, Me. While at college I had a very good schooling in the use of non-cohesive gold, as one of my instructors was an enthusiast on this subject, and the instructions received at that time have been of great benefit to myself and to my patients. It should be the aim of every dentist to save teeth with the least possible waste of tooth-structure and the least pain to the patient, and in cases where its use is indicated this ideal can be nearer approached with non-cohesive gold.

In regard to the use of gold and tin foil in combination, I will say that I have used it quite extensively with very flattering results.

Dr. GERRISH. I have nothing special to say in closing. With regard to the

use of non-cohesive and cohesive gold I will say that I have faith in cohesive gold. I have done work with it myself, and I believe it is a good material and is used by many operators to good advantage. I think each kind has its place among the filling materials. My contention is that the teeth can be better filled with non-cohesive gold from the fact that less tooth-structure is sacrificed and that there is less pain to the patient with much more ease to the operator. I have worked it so long that I have gotten to where I can use it now with scarcely any wall, and that brings me to the point to which I wished to give stress in my talk—to work along one line long enough to be able to do it properly.

The subject was passed, and Dr. JOHN S. FLAGG, M.D., Boston, Mass., read a paper on "Consciousness in Evolution."

Dr. J. WARREN ACHORN, Boston, Mass., then read a paper on "Diet in Riggs' Disease (Pyorrhea Alveolaris)." (Printed in full in March issue of the DENTAL COSMOS, at page 189.)

Discussion.

The PRESIDENT. You have listened to this very interesting paper on dietetics, and I know we have all enjoyed and profited by it and would like to discuss it. While listening to the paper the thought came to me that possibly the day will come when the bill of fare for the family table and for the hotel will be prepared by the physician, so that the elements for complete nutrition may be provided for us properly proportioned. The chair would like a free and full discussion of the doctor's paper.

Dr. L. C. TAYLOR, Hartford. I want to say a few words with regard to the doctor's theory of diet as a cure for Riggs' disease. I believe that in cases where the mucous membrane is affected from Riggs' disease, one may by dieting get some beneficial results as to the eruptions; as to the cure of the disease, however, I do not believe it can be effected by dieting. I had the honor of being a student of Dr. Riggs for six years, and was associated with him in the same

office for two years, seeing him treat case after case of what is called Riggs' disease. I agree with his theory that it is purely mechanical irritation, caused by deposition upon the teeth setting up irritation and causing absorption of the tissues. That is the whole trouble, and it can be cured in its incipency by the removal of the irritant. There are only three methods of curing this disease—namely, by extracting the teeth, which will cure it; the radical and thorough removal of all deposits; thirdly, by removing the greater portion of the deposit, and stimulating the tissues so that the remaining deposit will be thrown off and new tissue stimulated. I believe in diet, but as a cure for Riggs' disease I cannot indorse the theory.

Dr. F. L. MARSHALL, Boston. I have the uric acid diathesis, and several of the bad habits the doctor referred to, and I feel that I am a lost man so far as pyorrhea is concerned. I am very much interested in the disease, and I have obtained some good results in the treatment of it for my patients. As to Dr. Taylor's statement that it is purely mechanical, I cannot agree with him in that. There may be some kinds of Riggs' disease caused purely from mechanical irritation, but there are other kinds that I believe are produced from other causes. You frequently find anemic conditions, therefore I do not see how they can be classed as mechanical.

In regard to Dr. Achorn's theory of systemic treatment for the disease, I wish I knew more about it. I think that is the whole secret of the treatment of this trouble. If we could treat our patients so as to remove the constitutional causes that aggravate and bring about these conditions, I believe we would have the key to the situation. We can do much good in the local treatment, but I do not believe a cure can be effected in all cases in this way. It is the greatest problem confronting the dental practitioner of to-day—the treatment of Riggs' disease. There are more patients suffering from it than from any other disease, and there is less done for their relief.

For instance: I had a patient who

came to me not a great while ago suffering badly from pyorrhea. He had been under the care of a prominent dentist in the city. He had lost several teeth, and the dentist told him that he would lose more, so the patient was very much distressed. When he came to me his teeth were in a bad condition, but I told him I was sure I could help his case, that I could save the teeth for him for some time to come, though I could not promise to cure him. I firmly believe that if I had been thoroughly familiar with the constitutional treatment necessary for cases of this kind, I could, together with the local treatment that I gave him, have cured the case. I have kept his teeth in good condition for a long while now by a treatment that stimulates the gums, and by keeping the teeth clean, but I cannot effect a cure.

I think we should give more attention to this disease to see if we cannot find something to counteract the original tendencies.

Dr. J. W. SHAW, Springfield. I have had considerable experience in the treatment of so-called Riggs' disease, and I feel that a great majority of the teeth affected can be saved, and the disease not only checked but cured. As Dr. Marshall has just remarked, I believe much can be done toward such a cure by constitutional treatment, as many cases seem to be due to faulty nutrition. I believe it is aggravated in a good many cases by an insufficient quantity of water being ingested, and also by lack of care on the part of the patient. We can have our patients aid us by suggesting to them to thoroughly massage the gums once or twice a day. I have done this and it has helped me wonderfully in my treatment of the disease. I have a number of cases that I treated six or eight years ago, and they are in perfect condition to-day and have had no recurrence of the disease. The whole secret has been in the thorough cleansing of the teeth and proper stimulation to the gums. I have one patient who came to me about six years ago who had lost all but ten teeth, and these were all affected, having deep pockets around the roots with pus exud-

ing. I treated the case by cleansing the roots thoroughly and cauterizing the pockets, while the patient was instructed to give the gums thorough massage once or twice daily. I saw the case recently and the gums are in a normal condition with no return of the disease and no loss of teeth.

The gums need exercise in order to be in health, as much as does any other portion of the body, and my experience has been that there is nothing that equals this massage—the rubbing of the gums with the fingers daily or occasionally, as the case may require, to keep them in tone and health after the thorough removal of all deposits. This disease, by whatsoever name it may be called, I believe to be a local expression of a general disorder—a lack of balance between nutrition and elimination. The ingestion of an insufficient quantity of water to properly wash out and eliminate waste products, the lack of proper exercise of our lungs in supplying ourselves with oxygen, with the consequent suboxidation of waste materials which results in a sluggish circulation throughout the body and in the gums in particular, are factors in the production of this disease. Give your patients who are afflicted with this disease the local treatment that the case demands, and advise them regarding the selection of their food, the quantity of water to be ingested, the breathing of a sufficient quantity of air, the proper amount of exercise both of the body and of the gums, and, if they heed your advice, success will be yours.

Dr. C. H. GERRISH, Exeter, N. H. I would like to say a few words on this subject in the same line as my talk this morning, in regard to the proper and frequent cleansing of the teeth of our patients. I believe it is most important to pay the proper attention to cleansing and polishing the teeth, and I think it is a great preventive treatment for pyorrhea. A great many dentists are not willing to do it, and they do not pay the proper attention to this feature of their practice; and neglect on their part leads to neglect on the part of the patient. My opinion is that a great deal less of

pyorrhea would exist if the proper attention were paid to the teeth in the younger days, and the patient taught the necessity of keeping it up.

Dr. J. E. POWER, Providence. In regard to the local treatment of pyorrhea, I would like to ask a question as to the mouth-washes prescribed. Whether the disease be local or constitutional, we all use mouth-washes in the treatment. It seems that listerine is almost universally prescribed for this purpose. I used it for some time, but concluded that it was not the proper wash to use. It seemed to me that in many cases the use of listerine increased the progress of the disease, which result was probably due to the acidity of the drug.

Not a great while ago I had the pleasure of listening to Dr. Marshall of Boston on this subject, and he recommended a prescription for the treatment of pyorrhea. I have been using it for the past eighteen months and find that I have better results from this mixture than from any I have ever used.

Dr. Marshall's mixture contains equal parts of aromatic sulfuric acid, carbolic acid, ninety-five per cent. glycerin, with the addition of from five drops to twenty drops of formalin to the ounce. This was placed in the pockets by means of a shred of bibulous paper saturated with the solution, and allowed to remain at least twenty-four hours.

I have also used milk of magnesia as a mouth-wash, and have prescribed doses internally upon retiring. There is a question in my mind as to just how much good washes are, especially when we decide that the disease is from a constitutional cause. I would like to know if any others have had a similar experience to mine with listerine.

Dr. W. V-B. AMES, Chicago. I cannot resist saying something on this subject. I enjoyed the paper very much, and believe that the doctor has some very valuable ideas. I have been very much interested in the subject of pyorrhea for a number of years, and as a result of my study and work along this line I feel that I can now accomplish what I thought once I would never be able to do—that is,

prevent the loss of teeth in any case of pyorrhea no matter whether from a systemic or local cause. That is a strong statement to make, but when I present a paper next month to the New York Odontological Society on this subject I am going to say some things that have never been put so broadly before.* I congratulate the society on having secured Dr. Achorn to read this paper, in which he has given so much in the way of positive results. He has given us more than we have had before, and he has given it without hedging his statements; he has come with definite ideas. He has said that in probably nine out of ten of the cases of pyorrhea where loosening of the teeth occurs it is from local causes, and he has given us data to justify his statements. This paper will be a help to me when I have a chance to study it, and it is encouraging to hear Dr. Achorn say that such a percentage of the cases of loose teeth are of local origin.

Dr. B. J. CIGRAND, Chicago. I agree with the previous speakers that the essayist has gone into this subject clearly and given us something to stand on. The paper brought to my mind the thought that we are just beginning to learn how to live. I agree with the president, Dr. Bliven, in his belief that too little attention is paid to this most important subject. We should have, at all large hotels, menus prepared by a competent physician, showing us what to eat and when to eat it. There is no doubt in my mind that the preventive treatment is one of the most important methods of combating this disease; for it is a disease, not a condition. With regard to the question of whether it is local or systemic, I am inclined to believe that it might be either, though the majority of cases are, I think, from systemic troubles—induced by improper diet. Much good, however, can be done by local treatment. Some years ago I had a case of pyorrhea that affected seriously the anterior teeth. After I had used my best efforts to remove the deposits, I thought that the teeth ought to have rest

after the operation; there should be stationality. (I believe that rest is as necessary after this operation as after any other operation, especially where the osseous tissue is involved. If the teeth are left in this state and the patient goes on using them the same as ever, all the movements of mastication will keep the surrounding tissues disturbed, and how can the gums resist the disease and build up new tissue when there is a disturbance going on all the time?) With this idea in view I made an impression and swaged a gold splint to cover all the teeth and extend around to those in sound condition. This I cemented in place so as to give the teeth the desired rest, and after this had been in place for six months I found that the teeth were in better condition and showed more improvement than they had from six years' previous treatment. I advocate surgical treatment, but I believe that when surgical treatment is resorted to and the parts are stimulated to build up new tissue, the teeth should be held tightly in a stationary position to allow this process to proceed without any disturbance.

I have no special treatment to suggest in these cases. I use dilute sulfuric acid to irritate the parts, applied once or twice a week during the first two months, then I use extract of geranium to create constriction of the gums around the necks of the teeth to prevent foodstuffs from getting down between the roots. Dr. Powers will find this method of advantage, and I hope he will investigate the splint method.

I agree with the essayist that the present generation is eating too much meat and drinking too little water. These two points struck me very forcibly. There is a great deal in Dr. Achorn's theory of diet in these cases. We must learn that an ounce of prevention is worth about ten pounds of cure.

Dr. JOHN S. FLAGG, Boston. I have had a good deal to do with treatment of pyorrhea. I have usually several cases under my care, and for five years I kept a tabulated statement of the cases. I always make an analysis of the urine and a blood examination. I am convinced

* See page 355 of the present issue of the DENTAL COSMOS.

that the uric acid diathesis plays an important part in some cases. I found uric acid diathesis in eighteen per cent. of the cases examined; indications of syphilis in nine per cent.; anemia in over thirty per cent.; mercuric poisoning in eleven per cent., and minor causes. I cannot agree with the gentleman who has made the statement that all pyorrhea is of local origin. I agree that there are usually deposits around the teeth, but I have no doubt they come from the blood. It is simply an indication of the systemic disturbance. This is substantiated by the fact that we frequently find these deposits three or four lines under the gum with excess of blood to the parts and frequently pus exuding; I am firmly convinced that these deposits come from the blood. I have analyzed them and I have found in nearly every case calcium oxalate and urates. From the salts found in these analyses it would indicate that it was lack of balance in the system, that there was non-elimination in some of the organs.

Dr. L. C. TAYLOR. It is true that we find excess of blood, and pus exuding, but I attribute it simply to a mechanical irritation. Take the case of a splinter in the flesh. Is there not excess of blood to the parts, followed by pus if the splinter be allowed to remain? It cannot be remedied until the splinter is removed. In pyorrhea, if this irritant is allowed to remain it will eventually extend to the alveolar border and cause necrosis. The only way to relieve this is to remove the irritant, which I contend is simply mechanical. I cannot agree with the doctor that dieting is the proper treatment for pyorrhea.

Dr. J. E. POWER, Providence. What Dr. Cigrand has said about using a gold splint to keep the teeth in position has opened a new line of thought in my mind. We all know that to get the desired results in surgery we must have rest, and this is brought about by fixation of the parts. This principle may well be applied to teeth affected by pyorrhea, for, as Dr. Cigrand says, it is a surgical disease. It may be compared to a fractured jaw, and every man here knows that if

the fragments of the fractured bone are not brought into apposition and the jaw held firmly by bandage or splint or whatever appliance is suggested by the case, thereby getting fixation, a satisfactory result cannot be obtained, regardless of what the constitutional treatment may be.

Without having the teeth affected by pyorrhea "fixed," thereby getting rest, it seems that all our treatment, whether constitutional or local, would not help our patients if the teeth were allowed to remain loose; and all we might do in months would be undone in a week, unless we regarded pyorrhea as a surgical disease and applied the principles of fixation or rest.

Dr. AMES. Since the discussion has taken the turn it has, I will say that the title of the paper I said I was going to read is, "Bridge Work a Possible Factor in the Cure of Pyorrhea Alveolaris."

Dr. ACHORN, in closing the discussion, said that where he got his idea about the application of diet to Riggs' disease was the discovery of the cure of several cases in which he was treating the patient for some other constitutional trouble. He then described several cases that he had been treating for different diseases by dieting them, not knowing that they had pyorrhea, stating that when he had relieved them of the main trouble he found that the teeth were in firm condition and the gums had returned to their natural color. He said the gums had receded from their original line in some cases, but were of good healthy color, and the teeth very firm.

The subject was passed, and motion to adjourn was put and carried.

Afternoon Session.

In the afternoon session the society listened to a paper from Dr. L. C. TAYLOR of Hartford, Conn., entitled "Hygienic Fillings." (Published in the December 1902 issue of the DENTAL COSMOS, page 1245.)

Discussion.

Dr. A. J. CUTTING, Southington, Conn. It is usually customary for the one who

is to discuss a paper to be allowed the privilege of reading the paper beforehand, but I have never seen this paper before. I will say, however, that I do not use this method as generally as Dr. Taylor uses it, although I have done a good deal of this kind of work. That is, I frequently line cavities with a thin or soft cement and immediately put my filling of gold or amalgam in before the cement is set. I cannot advocate it so promiscuously as he does. I am always very careful not to let the cement get to the edges of the cavity. I do not mean to put in enough to make it flow over the edges. If any happens to get on the edges, however, I am very careful to prepare the edges over again, not trusting to my eyesight to clean it. I have been using this method for at least ten years. The principal reason why I use it is to avoid the effect of thermal changes on sensitive dentin in large cavities—which so often endangers the life of the tooth—by having the layer of cement between the metal and the dentin. I do not usually use this method to hold the filling in the tooth, but have had occasion to refill some, and I find it is a very difficult matter to remove one of the fillings. I think its greatest advantage is in using it for the purpose I have just mentioned.

Dr. W. I. BRIGHAM, South Framingham. I am fully in accord with all that the essayist has said with regard to this class of fillings. I think it an admirable way to put in many gold fillings. I do not use the method extensively. I would say that this class is not so easily put in as one might think; it requires good manipulation to get good results. No one will deny that cement has good preservative properties, and I think the fillings are very good. Whether they will last as long as the all-gold filling I do not know; I have seen them last a long time. We all have failures and successes. When I put in a filling and it lasts ten years I do not call it a failure; I call it a success. If it lasts five years it is a success. It was simply mechanical repair, and it served the purpose for that length of time. There is another point to be taken

into consideration with this line of work, and that is that the man who advocates this method is a man who has been in practice for years, and although handicapped by a physical infirmity and past the prime of life, he enjoys a good practice to-day. He has made a success in his work, and for no other reason than his ambition to serve his patients well, and he recommends this to you to-day because, knowing that he himself is serving his patients well, he believes that you will be doing the same thing in following this method of practice.

Dr. W. V-B. AMES, Chicago. After listening to the paper and hearing the remarks of the other gentlemen it is plain that there is safety in such an operation, so it simply settles down to the question whether it is a time-saver. I have had considerable experience in inlay work, both gold and porcelain. My observation of the result of work of a dozen years' standing has proved satisfactorily to my mind that a leak in such fillings that does not extend beyond the depth of the enamel is not a serious matter. I have examined many inlays and work of this character where the explorer could be passed down between the filling and the tooth-structure, but if it did not extend farther than the thickness of the enamel there was never any decay. This has demonstrated to my mind that if gold fillings be inserted so that the possibility of leakage in the region of the dentin is avoided, you have a safe operation; and this argues very favorably for this character of work. The only note of alarm to be sounded in connection with such operations is that their extensive adoption might lead to careless and faulty cavity preparation and slovenly handling of materials.

The PRESIDENT. I can indorse what Dr. Ames says with regard to the fact of there being a space between the filling and the tooth and yet no decay so long as it does not encroach upon the dentin. Fourteen years ago I put in one of the first contour inlay fillings I had ever seen. I experimented along this line, and tried them in two central incisor teeth adjacent to each other. I never

saw those fillings again for four years. I was very proud of the work at the time, because I thought I had accomplished better results in this line than I ever did before. The next time I saw the fillings the cement was dissolved out around the inlays, but the margins were free from decay. I was very much discouraged, but thought I would leave them and watch the results, asking the patient to advise me if the fillings came out. I heard nothing further from her, but about twelve years afterward I met a gentleman in whose employ she was when this operation was performed, and inquired if he had seen her recently. He replied that he had. I then asked him if he remembered those two fillings, and how they were getting on. He said they were still there, and as strong as ever. I know that there is a good wide margin between the porcelain and the enamel, and yet for twelve years these fillings, with cement back of them, have preserved the teeth intact.

Dr. STRANG, Bridgeport. I think it was about 1890 that I began experimenting with the combination of oxyphosphate and amalgam for filling teeth. I have always disclaimed any originality in this work, as I got the idea from a dental journal some time before I began my experimenting. About two years ago, I saw in one of the dental journals that a gentleman in the west had first suggested the idea. About three years ago, in an address on this subject before the Stomatological Society I disclaimed any credit for originality in the method. I have been using this method since about 1890, and I have been very much pleased with the results. I have been disappointed in some cases, but whether the fault lay in the oxyphosphate or in the combination of the two materials I am unable to say. I have many operations that were performed in 1890 that are doing good service to-day. I wish to say, however, that I use this combination only in the poorest class of teeth. If

there is good strong tooth-structure, I prefer to use amalgam or gold. I believe that in poorly developed teeth, with large cavities and weak walls, nothing will preserve that class of cases as well as the combination of amalgam and oxyphosphate. I have had practically no experience with the manipulation of the oxyphosphate and gold in combination. I have never seen any of Dr. Taylor's work except that which he has just passed around.

I have many of these fillings extending below the gum margin, and they are in good condition, and the gum has not receded. In other cases I have found that they sometimes leak after the course of a year; I do not know whether the fault is in the preparation of the material, the combination, the secretions, or the oxyphosphate. I am not using it for operations extending under the gum now as much as formerly. I find that the amalgam will give better results in these cases than the combination. In cases where you cannot adjust the rubber dam, I think the combination filling is contra-indicated. I have no confidence in operations of this character made without the use of the rubber dam.

The subject was passed, Dr. Taylor not desiring to say anything additional on the subject.

Adjourned until 6 o'clock P.M.

Evening Session.

The session was called to order by the president at 6 o'clock, and Dr. CHAS McMANUS, Hartford, Conn., read a paper on "The Makers of Dentistry." (Printed in the November 1902 issue of the DENTAL COSMOS, at page 1105.)

Dr. McManus was accorded a hearty vote of thanks for his valuable paper.

On Friday morning various clinics were given, and in the afternoon some further business was transacted and the meeting adjourned.

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Devoted to the Interests of the Profession.

EDITED BY

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PHILADELPHIA, MAY 1903.

EDITORIAL DEPARTMENT.

DENTISTRY NOW AND THEN.

WE note an occasional tendency among speakers and writers on dentistry to bid us pause in our career of professional progress, so called, and inquire if we are after all really progressing,—to take a professional account of stock, as it were. Every once in a while some one with a tinge of pessimism in his tone tells us how much better it used to be in the good old days before we had “so much theory” and had “more real practical dentistry.” Again, we hear that quackery and empiricism are on the increase, and that true professionalism is languishing in these modern days,—a condition of things which should make us pause and think; yea, more, it should impel us to energetic efforts toward reformation and re-establishment of the old conditions, if we have indeed fallen off in standards or attainment to the extent suggested.

It is difficult and unsafe to attempt to decide questions of this character from the basis of anyone’s individual opinion only. Mental bias, temperament, or the group of factors included in that comprehensive phrase “personal equation,” is unfortunately too often a determining element in the formation of individual judgment not to be ignored, and in relying thereon we are likely to have forced upon us a realizing sense of the truth contained in the late Prof. Garretson’s axiom, “A thing is to the mind that uses it what to that mind it seems to be.” Hence we take it that these individual criticisms upon modern dentistry and the invidious distinctions which compare it unfavorably with the dentistry of the “good old times” are not altogether uninfluenced by the personal factors referred

to. Then again there is a psychological element that enters into these pessimistic expressions of individual opinion. That philosopher *sui generis* the late Henry W. Shaw, better known as "Josh Billings," once said that "A dog very soon forgets where he got a thrashing, but he never forgets where he got a bone," and it is one of the blessings of human life that its unpleasant features and disagreeable experiences, so far as the average individual is concerned, fade out of memory more quickly than do the pleasant ones. Where the view is otherwise in individual cases it may be regarded as a departure from the normal type, and one generally of hepatic origin. In the light of these premises we are inclined to believe that the pessimist is wrong, freely granting that our view is philosophically open to the criticism that it is temperamentally optimistic and therefore rests on no better foundation than does its antithesis.

But what are the facts? It is claimed that better practical dentists were made in former years than now. It is necessary to at once define what a practical dentist is before we institute comparisons of an historical character. We presume by practical dentist is meant one who knows the science and art of dentistry and is skilled in its application. If we examine the records of the "good old times" of more than a generation ago we find that dentists of that period knew no more of the causes of dental caries than did their predecessors of the fifteenth century; the theory that decay of the teeth was caused by lateral pressure of their contiguous surfaces was not only taught and believed, but that particular theory determined largely the mode of practice in the treatment of caries of the approximal surfaces. As a result, the astounding mutilation of teeth by filing, and even the practice of extracting teeth with a view to securing free separations, was a legitimate and, for that time, a rational mode of practice by the best practical dentists of the period during which the lateral pressure theory of decay held sway. The records further show that only within the last half-century has the successful treatment of pulpless teeth been a practical possibility—mainly because the relation of bacterial infection to periapical inflammation was unknown, and, until it was, the loss of a pulp was in the majority of cases equivalent to the loss of the tooth.

A study of that fanatical epoch embracing the so-called "amalgam war" clearly reveals the ignorance of the practitioners of the "good old times" with regard to the causes of suppurative inflammation about the apex of tooth-roots, for cases of "mercurial poisoning" from mineral paste are gravely reported which the modern practitioner easily recognizes as dento-alveolar abscess due to amalgam fillings inserted over infected and unfilled root-canals,—inflammations which the "good old times" practitioner tells us rapidly got well after the "nasty stuff," as he characterized the amalgam, was removed.

The practical dentist of little more than a generation ago knew but

little of pathology and nothing of bacteriology in relation to disease, for the obvious reason that the data upon which these important branches are based were not then discovered, and since their discovery the errors of practice of former years, due directly to lack of pathological data, have been or are being corrected, and scientific modes of procedure are being substituted.

That they filled teeth in those days, and with great skill, no one can gainsay; but has anyone given us a record of the teeth they ought to have filled well and didn't because from lack of sound scientific knowledge of pathology they were unable to restore their roots to a condition of normal health so that they would endure restoration by filling? It is probably a case analogous to the dog of Josh Billings; we have forgotten most of the failures and remembered the achievements of the earlier practitioners.

And what of prosthesis? We hear much of the great skill of those of the olden time in the matter of mechanical dentistry. Then it was that the practitioner was taught to compound, carve, and bake the teeth which he supplied to his patients. Why is it that none of the evidences of ancient craft now preserved to us in museums and elsewhere manifest that high artistic and manual skill so frequently referred to? We have examined many examples of these ancient dentures, and always in the hope of detecting something of that lost art in which the modern practitioner is often said to be deficient, but thus far with the feeling that the workmanship was that of the mechanic and not of the dentist; for each and all of them have seemed more like ghastly travesties upon nature's models than artistic reproductions of them—reproductions which to-day the new graduate of any reputable dental college could surpass in all the essential particulars of functional usefulness and artistic merit. The commercial production of artificial teeth in these modern times has made it unnecessary for the dentist to manufacture the porcelain teeth which he supplies to his patients; the art of block-carving and of porcelain teeth-making is therefore not a part of the training of the modern dentist. Were it to become necessary, however, we believe his manipulative skill as displayed in other branches to be sufficient to enable him to surpass in that department the results attained by his predecessors.

Good practical dentists to-day constitute the average of the craft. In the good old times they were conspicuous by reason of their being the exception. The literature of forty and fifty years ago is filled with criticisms of the degraded status of dental art—and there was no science. A few men, brilliant intellectually, exceptionally skilled, self-taught under the inspiration of a love for dentistry, and with an enthusiasm begotten of their love for their calling, created the organizations which made systematic dental education and a dental profession possible; and time only serves to enhance the splendor of their achievement and the estimate

of their individual merit as practitioners. But that they lacked very much of the knowledge which an average practitioner of to-day is expected to possess is shown by their published writings. Much which they ardently believed and which determined their modes of practice was based on ignorance and error. Many ordinary operations of to-day they were unable to perform because they did not have the necessary knowledge. Inherently the skill of the chosen few may have been even greater than that of the average practitioner of to-day, but its range of application was limited by the limitations of their knowledge as certainly as the same cause limits the skill of their professional descendants, for no man can do more than he knows how to do.

When we consider the skill required to successfully save teeth by modern methods of filling, or to combat the disorders dependent upon death of the pulp, or to construct the prosthetic restorations comprised in modern crown and bridge work and to secure the later artistic results in plate work, we are inclined to believe that the majority of practical dentists of the good old times would find it necessary to take a thorough post-graduate course before entering into practical competition in a modern community with a good practical dentist of to-day.

There is one other aspect of the question which involves the distinguishing difference between the practical dentist of former times and that of the present time—namely, the difference of their mental attitude toward their professional work. In the earlier period dental practice was largely empirical; if results were obtained it was by rule of thumb, for the reason that at that time no scientific basis of practice existed. The cause of caries was unknown; the causes of diseases of the pulp and peridental membrane, of erosion of the teeth, and of the disorders of the oral cavity generally, were not only *terra incognita*, but were guessed at and the guessing was wrong, and consequently often led to wrong modes of practice. The results of modern research in all departments of dentistry have not only improved our methods and our materials and increased our resources, but have given us the means of intelligently and rationally applying them to practice.

Like children who have learned to talk, these pioneers may be said to have learned the language of dental practice, but their successors are learning the grammar of dental art, and are not only able to use it intelligently, but to correct errors in its application through a rational use of the science upon which it is based.

No!—we prefer to hold to the optimistic view that we make better practical dentists now than ever before, for the most practical man is he who knows the most about his calling and who can most skillfully apply his knowledge for his professional ends; and from that standpoint we believe the present to surpass the past in practical attainment of results in all departments of dental science and art.

REVIEW OF CURRENT DENTAL LITERATURE.

[*International Dental Journal*, April 1903.]

SOME USEFUL ANALGESICS. BY J. MORGAN HOWE, NEW YORK.

The author reports favorably on the use of wine of opium in relieving pain in pulpless teeth that continue to ache after local conditions have been made favorable and other applications have failed. Applied in the root-canal it often soothes the irritated periapical tissues. Mentho-phenol, made by melting together three parts of menthol crystals with one part phenol crystals, is another preparation which the author considers valuable in treating the conditions above mentioned. It has marked antiseptic properties, but is not a disinfectant to the degree required in the treatment of putrescent conditions.

[*Cincinnati Lancet-Clinic*.]

A CASE OF DOUBLE TONGUE. BY DR. M. A. TATE.

The author reports a case of a male infant whose frenum linguae was so large that it held the tongue down to the floor of the mouth. The frenum was ruptured, but still the child could not nurse. Every known expedient was resorted to to make the child suckle, but all proved unsuccessful. Another examination was made and it was found that the tongue was very thick and that the child could not protrude it beyond the gums. It was found that the frenum extended underneath the tongue, and it was cut by means of scissors; it was then discovered that the child had a double tongue, the smaller being beneath the larger. Inquiry revealed that the mother had a ridge of flesh on the under surface of the tongue, and it is probable that at birth she also had a double tongue. Two weeks later the child was nursing without interference and the superfluous tongue was undergoing rapid atrophy.

[*Bulletin de Thérapeutique*, Paris 1903.]

NOTE ON THE USE OF SODIUM HYPOSULFITE IN THE TREATMENT OF PUTRESCENT CONDITIONS OF ROOT-CANALS. BY M. CLARET, PARIS.

Cases of caries of the fourth degree (caries with root-canal infection) are usually treated by means of dressings of carbolic acid or cre-

asote. These agents, however, do not always eradicate the disturbance, and they are, besides, medicaments which must be handled with great care, because of their intense caustic properties. For this and other reasons, Mons. Claret began a series of experiments with sodium hyposulfite, with the view of ascertaining whether this agent could be used in connection with the treatment of putrescent root-canals. As sodium hyposulfite has proved to be a valuable agent in the treatment of purulent bronchitis and of gangrene of the bronchial extremities, the idea suggested itself to the author that this sodium compound might likewise be used in eliminating purulent conditions from pulp-canals. In two cases of intense infection the use of cotton dressings soaked in a saturated solution of sodium hyposulfite brought about in a few days the complete disappearance of the putrid condition of the root-canals of a tooth which had previously been unsuccessfully treated with carbolic acid and with creasote. Mons. Claret offers this merely as a suggestion, and urges dentists to try this agent, which offers the advantage of being neither toxic nor caustic.

[*Dental Record*, March 1903.]

ABSENCE OF TEETH. BY R. M. CAPON, L.D.S., GLASGOW.

The models presented by the essayist before the Liverpool District Odontological Society were of much interest, representing the mouths of a whole family, parents and seven children, the youngest twelve years of age and the eldest twenty-seven. The models showed that there were no less than twenty-seven of the permanent teeth missing which had never erupted. The models of the mouths of the three girls showed a deficiency of eight teeth. The eldest of the three has never erupted the upper lateral incisors and two of the lower bicuspids. The other two girls have some of the bicuspid teeth missing. The model of one of the girls, aged sixteen, shows that the temporary laterals and canines have not been as yet substituted by the permanent organs.

The boys, four in number, have between them a deficiency of eighteen teeth. The father has never erupted his upper lateral incisor, and the mother is the only member of the family in whom all the teeth have erupted.

[*Revue Odontologique*, Paris, February 1903.]

PRINCIPLES OF ORTHOPHONY IN RELATION TO VELO-PALATAL PROSTHESIS.

BY PROF. LÉON DELAIR, PARIS.

The congenital division of the palate is an infirmity which exists in children in the proportion of one to four thousand. In France alone an average of one hundred and twenty men a year are excused from military service for this cause. The operation of staphylorrhaphy improves the function of deglutition but not that of phonation, and only the use of large appliances with a hollow posterior projection partially filling up the naso-pharyngeal cavity have given reasonably good results. Incidentally, the author refers to the appliance which he has been using for the last twenty years, but while this is an improvement over those he had previously tried, it is nevertheless absolutely indispensable that the patient should be made to exercise gradually and systematically the accessory organs of speech. The method advocated by the author consists mainly in the gradual and systematic exercise of the tip of the tongue. This special and orthologic training produces a return of normal speech in about three months' time. Professor Delair has exhibited before the Société d'Odontologie several patients afflicted with congenital cleft palate who, with the aid of his appliances and his method of orthologic exercise, are able to express their thoughts in a manner from which one could hardly diagnose their infirmity.

[*l'Odontologie*, Paris, February 15, 1903.]

ESSAY ON DENTAL ARTICULATION. BY PROF. J. CHOQUET, PARIS.

Dr. Choquet's essay is a critical analysis of human articulation. He states that the different definitions of normal articulation, including that proposed by Tomes, are misleading, and offers instead the one from which it is gathered that articulation implies the relations existing between the upper and lower teeth in the state of normal occlusion. He discusses fully the relations between the upper and lower teeth, as well as some of the abnormal conditions responsible for the production of malocclusion.

Articulation varies in each individual, and the problem of the movements of the mandible cannot be solved unless proper attention be directed to the study of the temporo-mandibular articulation and to the shape of the glenoid cavity, and not, as is being done, at present, by limiting the observation to the muscles concerned in the opening and closing of the mouth.

[*Lancet*, February 28, 1903.]

EXPECTORATION OF A TOOTH THIRTEEN MONTHS AFTER INHALATION INTO THE LUNGS. BY W. E. CARNEGIE DIXON, EDINBURGH.

In December 1901 the patient, a marine engineer, aged twenty-eight, had twelve roots removed from the upper jaw on two consecutive days under nitrous oxid. After the second day's operation he experienced a slight feeling of uneasiness behind the sternum, accompanied by a slight cough but by no pain. This soon passed off, its occurrence being entirely forgotten. Soon afterward the patient suffered from an attack of influenza, and he coughed almost continuously until February 1903, when he felt an obstruction in the chest and coughed up a large mouthful of bright red clotted blood. In this he felt something hard, which on examination proved to be one of the roots of an upper molar tooth with a large cavity, the edges of which were so sharp and ragged that doubtless it had caused considerable damage to the tissues in which it had been imbedded for over a year.

[*Prager med. Wochenschrift*, Prague, 1902.]

MANDIBULAR ATROPHY. BY DR. FRITZ NEUMANN.

After a careful dissertation on the different causes of mandibular atrophy, the author describes the case of a seaman who at the age of sixteen suffered from a slight attack of scorbutus. The disease affected the mucous membrane only, and the teeth, which were strong and sound, remained undisturbed for thirteen years.

After the occurrence of a second attack his teeth became so loose that they could be removed with the fingers, and after a short time there remained only the upper right canine and the six lower front teeth. A year afterward he sought the author's services, as he desired to have prosthetic substitutes for the lost teeth. Plates were constructed and fitted to his satisfaction, but four and a half months after their insertion were no longer satisfactory, as the mandible had undergone marked atrophic changes. New plates were then made, but again after five months were of no use by reason of the atrophic changes which the mandible was continuously undergoing. These changes in the shape and size of the mandible continued for the space of two years, during which time five different plates had to be made.

Discussing the pathology of mandibular atrophy Dr. Neumann mentions the most important causes, such as extraction of teeth,

diseases of the periosteum, alveolar pyorrhea, mercurial and ulcerous stomatitis, tuberculosis of the mouth, arthritis, morphinism, etc. The author has observed that senile atrophy occurs frequently in persons of from forty to fifty years of age, and that the disturbance manifests itself by retraction of the gums and loosening of the roots of the teeth. The teeth become loose in groups, and are never all affected at once. Sometimes the bicuspids and molars are the ones affected, and sometimes the front teeth, but the canines are generally the last organs to become diseased. In the mandible the front teeth resist the disease the longest. The author has had a large experience in examining cases of mandibular atrophy in some of the leading hospitals of his city.

[*British Journal of Dental Science*, London, March 16, 1903.]

A CASE OF GONORRHEAL GINGIVITIS.

BY MR. SIDNEY VINES.

This case, which was originally reported in the *British Medical Journal*, was that of a middle-aged working man whose oral mucous membrane became the seat of gonorrheal infection, transmitted by picking his teeth with a wooden match whittled to a point. The patient was not careful of his hands, and in whittling the match infected it, as he already was suffering from infectious urethritis. The patient presented a very distressing appearance. Saliva was unceasingly escaping from the corners of the mouth. Every tooth was loose and bathed in pus. He could not eat or drink without difficulty, and vomited frequently. His temperature was 101° and the atmosphere at the bedside was very offensive. A solution of silver nitrate, ten grains to the ounce, was applied locally twice daily, and a mouth-wash of potassium permanganate was ordered. Through bacteriological examination it was positively ascertained that the inflammatory phenomena about the mouth were caused by the presence of gonococci.

[*International Dental Journal*, April 1903.]

NOTES ON MUMMIFICATION OF THE DENTAL PULP. BY WALTER H. NEALL, D.D.S., PHILADELPHIA.

The author reports twenty-one cases in which the use of mummifying agents have produced reasonably good results. Of the materials used, one was a proprietary preparation, another a paste procured at a dental supply house, and another a mixture made for the author, who employs a formula of long use.

Inasmuch as Dr. Neall's paper is a plea in favor of the use of mummifying pastes, and further considering that he is able to report favorably upon twenty-one cases, it is regrettable that the author does not give the ingredients of his particular paste.

Of the twenty-one cases reported, nine were of persons presenting either exposed or inflamed pulps, five did not visit the dentist until their teeth began to cause discomfort, and the remainder were equally divided between rapid decay of the third molar owing to ill health and the frequent tooth-disturbances due to pregnancy.

[*Rev. de Stomatologie*, Paris, February 1903.]

A CONTRIBUTION TO THE CLINICAL STUDY OF SEPTICEMIA OF BUCCODENTAL ORIGIN. BY DRS. JULIEN AND CAMILLE TELLIER, LYONS, FRANCE.

The appearance of phenomena of general intoxication following lesions of the mouth or of the gingivo-dental region is to-day a generally accepted fact. The authors state that as a rule only those cases that terminate fatally have been recorded, while those presenting non-fatal though serious disturbances have not been reported.

As is well known, there is found normally in the mouth a great variety of microbic species, some pathogenic and others non-pathogenic. As a rule they do not produce any effect upon the general health, but if the equilibrium is disturbed, either by an increase in the virulence of the intra-buccal micro-organic species, or by a general or local diminution of vital resistance, their noxious influence becomes at once manifest. When this equilibrium is destroyed phenomena of localized infection, abscesses, etc., appear, and at times infection at a remote region, resulting in serious consequences. The relatively mild forms of general infection would come under the head of buccal cachexia (Chassaignac), or of dental cachexia (Lejars), or to the more serious form which Richet has named acute putrid intoxication.

The study of these phenomena of general infection of buccal origin has been recently pursued by Sebileau. He distinguishes three clinical varieties: first, lymphatic or lymphophlegmonous septicemia of the neck; second, phlebo-phlegmonous septicemia of the face; third, general septicemia without fixed location. As all the observations reported by Sebileau terminated fatally, the authors have prepared this careful and painstaking report to show that there are cases which, though not fatal, may be classified under some one of

these groups. There are frequently observed cases of buccal infection which produce phenomena of general intoxication—not, however, of intensity to attract special attention. As an instance, it is asserted that alveolar polyarthritis with suppuration of long standing is often responsible for the production of impaired digestion, diarrhea, and general debility, these disorders being brought about by the deglutition of the pus from the alveoli.

The authors then describe in detail three cases of chronic septicemia following mild lesions of the mouth; two observations of phlebitic septicemia, one of lympho-phlegmonous septicemia, and one of death following general infection of dental origin.

[*Medical News*, New York, April 11, 1903.]

REPORT OF A CASE OF ONE-SIDED DISLOCATION OF THE MANDIBLE, REDUCED BY A NOVEL MANIPULATION.
BY FRANK WOODBURY, M.D., PHILADELPHIA.

The case in question was that of a woman, aged twenty, who had dislocated her mandible while attempting to bite an apple. The patient experienced no pain and only complained of the inconvenience due to the inability to completely close her mouth. She presented the characteristic deformity on the right side of the face. She had almost the normal range of motion in opening and closing the mouth, but the molars of the mandible on the right side could not be brought nearer than half an inch to the upper teeth, and there was the usual lateral deviation, so that the lower row of teeth on the right side were on a vertical plane internal to the upper teeth.

As the author failed to reduce the dislocation by following the classic method of pressing firmly upon the molars with the thumbs, guarded by a towel, while an effort was made to elevate the chin with the remaining fingers of both hands, he tried Nélaton's method by making pressure firmly upon the coronoid process, but this procedure was equally ineffective. Two other plans suggested themselves to the author, viz, the ancient expedient of placing a wooden block between the last molars, and applying a bandage to the head so as to elevate the chin, and leaving the case in this condition for a time, hoping for reduction by muscular action. The other plan was to give an anesthetic as advised by Gross, and, if found necessary, even to resort to the division of some fibers of the temporal, masseter, and internal pterygoid muscles in order to overcome the obstacle to the reduction. Before trying this latter method, the author made another attempt to reduce the disloca-

tion without the administration of an anesthetic. This time he tried a modification of Nélaton's method which proved successful. This consisted in grasping the ramus and angle of the mandible with the left hand, placing the thumb in front of the coronoid process. While pressing the bone upward and backward the patient was instructed to open and close her mouth several times, then at a time when the mouth was nearly closed, acting under impulse the operator struck the left side of the chin a sudden gentle blow with the right half-closed hand. Instantly the return of the condyle to its place was announced by a double click. The author expresses great satisfaction at the results obtained, as the operation is one of great simplicity.

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde*, January 1903.]

DIFFICULT ERUPTION OF THIRD MOLARS. BY L. GUILLERMIN.

In 1892 a woman aged forty sought Dr. Guillermin's advice regarding a disturbance which she believed to be caused by the concealed fragment of a root. The patient had had all her molar teeth extracted and upon the mandible there only remained the six anterior teeth. After a careful examination it was found that the disturbance was not caused by the fragment of a root, as supposed by the patient, but by an impacted third molar. The gum overlying the impacted tooth was lanced, and shortly after the tissues regained their normal condition. The operator, however, warned the patient that complete eruption would be a long process and that as the inevitable stagnation of food between the gum and the tooth would induce caries, she ought to visit a dentist at least every six months.

The author did not see the patient again for ten years, when she once more visited him on the advice of her physician. She presented the following symptoms: pallor, adynamic anemia, slight fever, anorexia. Upon the cheek a very hard swelling could be felt. The mouth could not be opened—a condition which interfered with nutrition and which also prevented the making of a careful examination. A very offensive odor could be perceived. The submaxillary and lymphatic glands were swollen. In one word, she presented all the symptoms of an infection. The physician diagnosed her condition as ulcero-membranous stomatitis, possibly noma.

Dr. Guillermin advised the use of hot applications of mercury bichlorid upon the cheek, and two days afterward the mouth could be opened sufficiently to examine the

condition of the mucous membrane. Extensive ulceration was found on the left side, extending from the ascending ramus of the jaw to the level of the lower second bicuspid, and from the gingivo-labial groove to the orifice of Stenson's duct. The epithelium at different places presented a disorganized appearance and from it exuded a muco-purulent liquid. Other parts of the mouth bled easily and upon the slightest contact. The preliminary treatment, which consisted in cauterizing the diseased area with silver nitrate and in the use of antiseptic mouth-washes, did not give any relief.

The essayist then remembered the patient's visit ten years previous, and concluded that all the suffering was due to the presence of an impacted third molar which had undergone a carious process. Before proceeding to extract the offensive cause the external applications of mercuric chlorid were continued, being sometimes alternated with potassium iodid and extract of belladonna. This treatment relieved the patient markedly. The surface of the ulceration was touched twice daily with a preparation composed of tincture of iodine three parts, trichloroacetic acid three parts, glycerin twelve parts, cocain one-half part. After this treatment had been continued for a short time the tooth was extracted and, as anticipated, all the pathological phenomena disappeared.

This report is interesting in view of the fact that disturbances caused by the difficult eruption of third molars are generally overlooked, the phenomena being attributed to other causes, particularly to infection of the mucous membrane from a neighboring diseased tooth. It is surprising, however, that with all the symptoms which the patient presented, a diagnosis of impacted third molar should not have been reached at once, inasmuch as disturbances of infective nature concomitant with mandibular trismus are almost pathognomonic signs of impacted third molars.

[*New York Medical Journal*, New York, February 21, 1903.]

PYEMIA AND EXSECTION OF PART OF THE LOWER JAW FOLLOWING A FRACTURE DUE TO TOOTH-EXTRACTION. BY J. A. HOFHEIMER, M.D., New York.

From his observations the author has concluded that fracture of the jaw due to tooth-extraction is of not uncommon occurrence, and he has frequently met with cases of this nature in dispensary practice, but cases of general pyemic infection or multiple abscesses as the sequel to the extraction of teeth is a rare

occurrence. In the case here reported there was, besides a general infection, a condition of increasing necrosis of the mandible posterior to the point of fracture, necessitating removal of the ascending ramus, including the condyle. The operation was performed by the intrabuccal method to avoid a large unseemly cicatrix of the face. The case under discussion was that of a boy, aged nine, who by reason of a severe toothache had a lower right first molar extracted, but in doing so the dentist fractured the mandible. The boy's face became greatly swollen and very painful. The symptoms of inflammation increased so rapidly that on the following day the family physician was consulted. It was impossible to examine the mouth from the tumefaction and pain of the soft parts. The physician was able, however, to ascertain that an abscess had formed and that pus was discharging from the lips, which were nearly closed by the swollen tissues. The abscess was incised and a considerable amount of pus was evacuated. This gave the patient temporary relief, and in a few days the swelling decreased and a diagnosis of fractured mandible was arrived at.

The author gives a detailed relation of the intense suffering of the patient incident to the formation of a metastatic abscess upon the right limb, and of the operation which had to be performed in order to eradicate this pus formation. It took several weeks for the limb to heal. In the meanwhile the wound in the mouth was discharging freely, and it was thought best not to resort to any operative measures at this time, trusting that as health returned the diseased bone would exfoliate and healthy tissue form in its stead. The mouth was washed out several times daily with antiseptic solutions, and syringed with hydrogen dioxid. After operation the temperature, which had been as high as 104° , decreased, but it never was below 101° , and ten days later the patient complained of pain in the right side of the shoulder. Another metastatic abscess had formed under the lower angle of the scapula. This was also treated surgically under cocain anesthesia, but even after this operation the patient's temperature did not descend to normal—a condition which indicated that the boy was not as yet on the road to health.

One month after the initial operation another had to be performed in order to evacuate an abscess upon the gluteal region. After this operation the temperature became normal and convalescence progressed satisfactorily. In the meanwhile spiculæ of bone exfoliated and were readily removed. The two teeth posterior to the seat of the fracture became loose, as the alveoli had undergone a necrotic pro-

cess. Finally a small inflamed area was noticed below the ascending ramus, and an operation was decided upon, as the abscess began to point externally. Under full anesthesia a small incision was made into the inflamed part and about a dram of pus escaped. The finger, on being introduced into the wound, could detect that the bone was denuded of its periosteum almost to its anterior surface. The remainder of the periosteum was detached with the attached muscu-

lar structures, and a similar procedure was accomplished on the inner side of the bone through the mouth by splitting the gum in the median line. The coronoid process was removed and a triangular space of bone was excised from the body of the jaw in order to obtain space for rotation. The result has been very satisfactory. The deformity is slight and is gradually lessening, new bone formation is already developing, and the health of the patient is now excellent.

PERISCOPE.

To Open Fissures.—To make a rapid cutting drill to open fissures with, take a round bur (No. 3 to No. 6) and grind it to a three-cornered sharp point.—F. C. NOYES, *Dental Brief*.

To Prevent the Mustache from Shutting Out the Light.—To prevent the mustache from shutting out the light when not using the dam, take a strip of white muslin one inch wide and three long, and draw the mustache back with it, fastening it with the dam-holder.—F. C. NOYES, *Dental Brief*.

Cleaning Glass Cement-Slabs.—Every practitioner knows how difficult it is to remove the cement which adheres to a glass cement-slab. Usually a knife is resorted to and the slab presents a scratched appearance therefrom. I accidentally discovered that dilute nitric acid will remove all cement particles, no matter how hard, and the slab, after being rinsed in water and dried, will have a clean, smooth surface.—GEO. ZEDERBAUM, *Dental Review*.

Highest Masticatory Pressure Ever Recorded.—The greatest pressure is sustained by the molars, the gnathodynamometer registering ordinarily from one hundred and fifty to two hundred and seventy pounds. Where there is any inflammation of the peridental membrane, or any other cause to make the teeth a little sensitive, the pressure exerted will be very low, sometimes not more than forty pounds; but with good, healthy teeth the pressure is great. Dr. E. K. Wedelstaedt, of St. Paul, Minn., has recorded within his own practice a pressure made by a patient of three hundred pounds. This is probably the highest pressure recorded.—ARTHUR N. DAVIS, *Items of Interest*.

Treatment of Lockjaw.—Baccelli's treatment of lockjaw by injection of carbolic acid has been attended with great success in Italy and elsewhere. The method consists in the injection of a two to three per cent. solution of carbolic acid. About thirty to forty centigrams of carbolic acid should be injected daily. Injections of hydrogen dioxid have been tried successfully on horses, as have intravenous injections of an iodid solution.—*Medical Record*.

How to Facilitate the Insertion of the Rubber Dam.—To facilitate the passage of rubber dam between teeth when the latter are close together: When ready to adjust, smear a little glycerin over the holes, on the side of dam which is to pass over the teeth. This answers instead of soap, recommended for the purpose, and is much less objectionable to the taste if it should come in contact with the patient's tongue.—R. E. SPARKS, *Dominion Dental Journal*.

Failures in Bridges.—Nearly all failures in bridges can be attributed either to the faulty articulation which allows the bridge to become displaced *en masse* or to the fact that one or more of the anchors loosen, exposing the pier teeth to decay. A bridge properly articulated often continues to perform its functions long after its anchors have loosened and the piers decayed away. Experience and close observation have convinced me that a greater proportion of the bridges would be better anchored to one tooth only, with a compensating articulation, or a pier on which one end of the bridge would rest loosely, permitting the normal movements of the teeth and allowing for all forces.—WM. SLOCUM DAVENPORT, *Internat. Dental Journal*.

A Medical View of the Causes of High Palate.—Grosheintz (*Arch. f. Laryngol.*, viii, No. 3), believes that the high, narrow palate is usually associated with a generally narrow configuration of the upper part of the face (leptoprosopy). Narrow nasal cavities (leptorrhiny) and narrow orbits are usually associated with high palate. High palate rests, as a rule, upon inborn facial peculiarity of skull formation, and is not influenced by causes operating after birth.—*Med. Review of Reviews*.

Special Instruments Unnecessary for Manipulating Soft Foil.—It was formerly thought necessary to have a special set of instruments to manipulate soft foil. From a modern point of view this is not only not necessary, but to be condemned. Any plugger that can be used advantageously for hard foil is likewise adaptable for soft foil. If the large plugger point is condemned for hard foil, it is doubly so for soft foil. Any good set of cohesive foil pluggers makes equally a most desirable set for soft.—G. S. JUNKERMAN, *Dental Summary*.

Advantages and Disadvantages of Tin and Gold over Gold Alone.—The advantages are—Ease and certainty of adaptation; economy in time to patient and operator; ease of perfect finishing; comfort of patient during operation; non-conducting qualities; good clinical record—better than gold. The disadvantages are—Color, as tin part of filling turns black (a dentist not acquainted with it may diagnose blackness as recurrence of decay or leakage at cervix of gold filling, and remove it); therefore, after inserting it, warn the patient in advance.—W. C. GOWAN, *Dominion Dental Journal*.

Excision of the Maxilla under Medullary Narcosis.—Dr. Morton reports upon the employment of spinal cocainization in 929 cases, in 76 for operations above the diaphragm, many of the latter being operations on the face and neck. He has found that the analgesia about the mouth is as complete as in the lower extremities, and that constitutional disturbances are no greater in operations about the mouth than they are in operations on the extremities. He is convinced that this method of producing analgesia has its greatest field of usefulness in operations so located that there is danger of blood and secretions entering the lungs. One case of excision of the upper jaw is reported in detail. The author uses half a grain of cocain hydrochlorid and injects it between the third and fourth lumbar vertebræ.—*Amer. Medicine*.

Iodyloform (*Deutsche med. Woch't*, No. 17, 1902).—Müller has found a new substitute for iodoform in a combination of iodine and gelatin known as iodyloform. This is a powder containing five per cent. of iodine and is insoluble in water, alcohol, or ether. He has used this in the treatment of venereal sores, syphilitic or not. The sores are first treated by "hot-air cauterization," blowing through a heating apparatus at short intervals. For simple sores a slight discoloration of the surface only is required, but for phagedena actual burning is wanted. The iodyloform powder is applied afterward. He has also used the powder in the treatment of buboes after incision.—C. F. M., *Treatment*.

Polishing Porcelain.—We hear a great deal about the necessity of fusing the surface of a porcelain inlay after it has been ground to shape in order to obtain the requisite glossy appearance; but this is wholly uncalled for. As perfect a polish may be given porcelain as can possibly be given gold or any of the metals. Grind the inlay or crown to the proper form, then go over the surface with a sandpaper disk, to be followed by a cuttlefish disk. Then with some tin oxid polishing putty and with wooden points as beautiful a surface may be given to porcelain as can be imparted to it by the furnace. By this method inlays may be ground at will, with the perfect assurance that a satisfactory finish may be given without fusing again.—C. F. HART, *Dental Review*.

Broaches Broken Beyond Apices.—Accidents will happen in the best regulated dental offices, and at the hands of the best operators. One occasional mishap is the breaking of a nerve-broach with the end protruding beyond the apex. If trouble and soreness follow, and the operator is sure of the character of the condition from measurement or X-ray examination, a remedy is looked for. The writer had experience with two cases: In the first extraction and replantation were resorted to. Result—absorption of the root and its loss after two years. In the second case the canal was filled, an opening was made through the soft tissues, then with a round bur the process was penetrated and the bur run rapidly upon and over the apex. This was done on May 19, 1901, and resulted in relief from pain and in recovery. The case had an interesting history. An interval of a year and a half had intervened between the time of the accident and the treatment described, during which there was constant soreness and occasional keen pain.—JOHN E. WILKINSON, *Dominion Dental Journal*.

Insertion of Fillings Facilitated by "Extension for Prevention."—The value of the system of extension for prevention is also brought out in the wonderful improvement it produces in facility for the introduction of the filling material. It gives free access, a clear view, and every opportunity to make perfect adaptation and stability. It is easier to fill against flat walls than into grooves or acute angles. Retention forms are such as to be readily accessible, because not deep or contracted. In proximal cavities of the molars and bicuspidis it makes the work easy, and it is here of the greatest value. This method of cavity preparation has also brought non-cohesive foil again into use, as it can be utilized to the best advantage in such preparation.—C. B. HAWLEY, *Western Dental Journal*.

Care of the Mouth during Sickness.—It would be better for the people if the physicians had a greater realizing sense of the very great benefit derived from the free use of alkaline and antiseptic mouth-washes during sickness,—not only in preventing the establishment of foci of infection for future dental caries, but also on account of the beneficial influence their free use would have over the systemic condition of their patients.—H. W. MOORE, *Pacific Dental Gazette*.

[Dr. William Hunter, in a series of articles in the *Journal of the British Dental Association*, vol. xxii, for 1901, very clearly and thoughtfully discusses the relation of oral sepsis to systemic disorders, calling attention to cases of septic gastritis and toxic neuritis brought about by mouth infection.—ED.]

Rubber Tissue as a Dressing.—In treating any lesion of the skin in which an ointment is indicated as a dressing, it is of prime importance that the parts should first be thoroughly protected from external infection; second, the ointment used should be kept in constant touch with the parts; third, the dressings, when changed, should come away without sticking and without damaging the newly formed and delicate epithelium; and fourth, the dressing should be kept on as long as possible. All these requirements are admirably filled by rubber tissue. The parts after having been cleansed with warm sterile water and green soap should be dried; the ointment is then spread on and covered over smoothly with sterile rubber tissue. Sterile lint is next applied and the whole secured with a gauze bandage.—G. TUCKER SMITH, *Amer. Journ. of the Med. Sciences*.

The Relations of the Oral Cavity to the Associated Parts.—A habit acquired by the dentist of regarding every problem presented to him in its broadest light will cultivate in him the faculty of intelligent diagnosis. I would urge upon every ambitious dentist to procure for himself a tongue depressor and a nasal speculum (your mouth-mirror will do for a laryngeal mirror), accustom himself to their use, and use them frequently. You will be surprised to see how an intelligent use of these few instruments, with proper illumination, will interest you and enlarge your views as to the relations of the oral cavity to its associated spaces, the nares, naso-pharynx and fauces; to say nothing of those lurking-places of disease—the antrum of Highmore, the sphenoidal and ethmoidal cells.—J. H. MARTINDALE, *Pacific Dental Gazette*.

Disturbances Caused by the Change in Position of Unopposed Teeth.—Do not think that when a space has been about filled by the movement of adjoining teeth into the breach once occupied there is no further room for improvement. How often do roots move in unison with their crowns? Seldom if ever; especially so with the molars. What happens? A tilting, producing a pyramidal effect with the base toward the gum. This favors the lodging of food débris, which either presses on the gum, inciting severe pain, or invites caries. The patient thinks the nerve exposed, for it throbs whenever anything cold strikes it. What is the trouble? Merely the recession of the gum substance and exposure of the pericementum due to the pressure of accumulated and decaying foods.—GEO. M. CHASE, *Pacific Dental Gazette*.

Method of Attaching a Cusp to a Band.—After the cusp has been swaged and fitted to the band it can be attached in the correct relation in a very simple manner before removing the band from the articulated model. Arrange the cusp in its correct position on the band, place a little asbestos fiber over the occlusal surface of the cusp, and close the articulator. Care must be taken that the cusp is not forced out of position when the opposite teeth are brought in contact with the asbestos. The cusps of these teeth will sink into the asbestos, holding the metal cusp firmly against the band and the articulator can be held closed with a piece of wire. The cusp and band can now be united at a convenient point with a small piece of solder and can then be removed from the model, and the soldering finished in the usual way.—*Dental Review*.

An Operative Engine the Size of a Dime.—A number of tiny engines have been constructed at different times, but doubtless the smallest which has yet been built which is actually operated was recently completed by Mr. A. G. Root of Danbury, Conn. It stands on a piece of metal just the size of an American ten-cent piece, the materials of which it is made being gold, silver, brass, and steel. The largest part of the engine is less than a half-inch in length, the fly-wheel being but 7-64 inch in diameter, while the main shaft of steel is but 5-16 inch in length. The band of the fly-wheel is of gold. The total weight of the engine without the base is but three penny-weights and its total height is less than a half-inch. In making the various parts and putting them together it was necessary to use a magnifying glass on account of the delicacy of the work, yet the engine runs perfectly, compressed air applied through a tiny tube being used for power. As long as the air supply is maintained, it continues in motion. The horse-power developed is so small that it cannot be estimated.—*Scientific American*.

What is Pure Chloroform?—Luke (*Edinb. Med. Journal*, June 1902) deals with the alcohol factor and the effect of impurities in chloroform. He asserts that the methyl alcohol used in making so-called "methylated" chloroform is, to all intents and purposes, ethyl alcohol freed from methylic impurity, as it is purified and rectified during the making of chloroform. Thus an extra and unnecessary expenditure on chloroform "made from ethylic alcohol" may be avoided by using the cheaper and just as pure article. Luke quotes instances to show the comparatively insignificant importance of impurities, if present in chloroform, and aptly quotes Snow's assertion in regard to the supposed deadly effect of impurities that "we ought to be told with what substance stronger than itself chloroform is likely to be contaminated." Luke observes that chloroform is one of the most powerful poisons used therapeutically, and is used with such laxity of dose and method that the only wonder is that more fatalities do not occur.—*Treatment*.

Bridging of Spaces in Soldering.—Take of filings of an easy-flowing solder, and filings of the gold to be soldered, or some higher-fusing metal, about equal parts. Also borax and water rubbed up in a mortar or otherwise to make a creamy solution. Mix the filings with sufficient borax solution to make a thick paste. Pack the joint to be soldered with

this paste and heat till fused. Care should be taken that the entire mass is evenly heated throughout, and of course all the ordinary precautions of having the surfaces bright and clean, etc., must be observed. This method is especially adapted when large spaces are to be bridged, or where it is desirable to add to a cusp or to contour or otherwise change the shape of a piece in any way. Almost any form desired may be obtained, due allowance being made for shrinkage. The particles of high-fusing metal serve as a support to retain the shape of the mass, and the low-fusing solder acts as a cement when fused to unite these particles and bind them to the piece being soldered.—F. W. STEPHAN, *Dental Summary*.

Treatment of Cancerous Affections of the Skin by Means of the X-Rays.—As a result of his observations, Dr. Taylor (*Liverpool Medico-Chirurgical Journal*) presents the following conclusions: First, that the rays are especially indicated in cases of inoperable cancer of the skin. Second, that the best results are obtained when the disease is confined to the soft parts. Third, that owing to the complete relief of pain and a superior cosmetic result obtained by this treatment, patients too readily assume that they are well before they really are; therefore they should be warned that a recurrence may take place. In the discussion of this paper Roberts stated that he believed that the effects on the tissues of the skin of the X-rays were, broadly speaking, of two orders: (1) Those of a kind analogous to burning; (2) specific effects. Roentgen rays appeared to exert a specific action on degenerative epithelium. Rodent ulcer was a purely epithelial disease, and there could be no question that the rays caused a dissolution of the new epithelial cells. The same was true of epithelioma and possibly to some extent of other forms of cancer. The remedial influence of these rays on lupus is to be attributed to their burning action and not to any specific influence.

Treatment of Hypersensitive Palate by Digital Massage.—In a practice of forty years I have had many patients who vomited so easily that it was impossible for them to wear a plate. One woman fainted away when the impression was taken, and later she carried the plate home in her pocket. I advised her to daily practice rubbing the roof of the mouth with the finger. This she did and in a few weeks could wear her plate in comfort. Shortly after this an old gentleman came to

me for a set of teeth. He already had several sets in his pocket, all of them cut in horse-shoe shape by the dentists who made them, for the purpose of getting around the gagging spot; but to no purpose, for the patient would gag if the roof of his mouth was touched in any spot. I did not attempt to take his impression, but sent him home with the same advice I had given the woman. In a few weeks he returned and I made him a set which he is still wearing. I have heard of many remedies and have tried some, but found them of no value. Until your patient can bear the finger on the roof of the mouth there is no use in his trying to wear a plate; but he can do it after a few weeks of constant massage as above directed.—H. D. MANN, *Dental Office and Laboratory*.

Use of Tropacocain in Dental Extractions.—Fuchs-Goeding (*Zahnärztl. Rundsch.*—*Centralbl. f. Zahnheilk. u. Zahntechnik*, No. 499) has used tropacocain local anesthesia in over four hundred extractions. He tried both five per cent. and three per cent. solutions, infiltrated the gum, and always obtained full anesthesia. He never saw deleterious after-effects in his operating room, but many patients complained when they reached home, about half an hour after operation, of feeling unwell. Many complained of weakness and headache, others of tremblings in the limbs or of palpitation of the heart. In one case violent shivering came on, and lasted for between half an hour and an hour, when the patient went to sleep, afterward awaking well. None of the patients, however, were seriously ill, yet the author resolved to use much weaker solutions, and availed himself of Schleich's method, under which he has done about 350 extractions, some of them in hysterical women and epileptics. He has had no failures, and uses only Schleich's strong solution, viz:

Take—Tropacocain,	0.3 gm.
Sodium chlorid,	0.2 “
Distilled water,	100.00 “

The needed quantity, two to three grams, must be injected into the gum, but this must be infiltrated till it is quite anemic. Fuchs-Goeding recommends tropacocain in the form of Schleich's infiltration as a very useful and quite harmless local anesthetic.—W. J. M., *Treatment*.

Early Diagnosis of Cancer of the Tongue.—The early diagnosis of cancer of the tongue is easily made; and, further, the disease is usually preceded by certain easily recognizable precancerous conditions. Among

these conditions are leucoplakia or leucoma, glossitis, warty growths, and ulcers. All these conditions may be classed under the head of chronic superficial glossitis, and it makes no difference whether the condition is due to past syphilis, to rheumatism or gout, or to excessive use of tobacco or alcohol, any person who has such a condition of the tongue is liable to cancer. Lumps and nodules in the tongue rarely become cancerous—it is only the surface conditions that are dangerous. The author protests against the usual treatment of such cases by physicians—the use of silver nitrate, lotions, washes, iodids, etc., which does no good and permits the development of cancer. Early and radical operation is called for in every suspicious case. The laity are ignorant of the deadly nature of the disease and are prejudiced against operations on the tongue; the operation itself is generally believed to be very dangerous, and there is fear of loss of power of speech. Warty growths should be cut out by means of elliptical incisions, and the edges brought together, when healing will take place in four or five days. Indolent superficial ulcers are often thought to be due to irritation from a tooth; remove the tooth, and if the ulcer does not heal, cut it out. If white patches or plaques become thicker, remove them at once. The author even goes so far as to remove portions of the tongue in cases of obstinate superficial glossitis.—*New York Med. Journal*.

The Effect of Agitation upon the Microbe.—Most germicides are more or less poisonous to the human organism and therefore the destruction of bacteria in food and drink by the addition of powerful antiseptics is not available. It is well known, however, that certain physical agencies exert a germicidal action, as, for example, light, electricity, and heat, and to these must be added the curious influence of mechanical shock. According to a number of interesting experiments on this point there can be little doubt that the vitality of lower organisms is influenced by agitation; even to the extent of total destruction. Thus, by submitting to violent agitation certain bacterial cultures, it has been found that the number of germs diminished to less than one-tenth of that originally present. Ultimately, by prolonging the treatment, the liquid was entirely freed from active germs and failed to develop further organisms, even when placed under favorable conditions. By adding some glass beads to the bacterial culture the effect was more prompt, the liquid becoming sterile. In another experi-

ment bacterial cultures were allowed to stand in the engine-room of a large manufactory in which an incessant vibration was produced by the strokes of the engine, with the result that after four days the vitality of the germs was completely destroyed, while in the control samples, which were left in a quiet place, the germs, it was found, had retained their activity. It would appear from this interesting experiment that minute vibrations have the power of hindering the growth of micro-organisms as well as violent shocks, while if either treatment be continued the germs at length die.—*Lancet*.

Removal of Artificial Teeth from Alimentary Tract.—The prominence recently given by the lay press to accounts of an operation for the removal of a dental plate which was supposed to have been swallowed, but which after the death of the patient was found in his room, is now followed by a timely report on the case by the attending surgeon, G. W. Crile (*Cleveland Med. Journal*, December 1902). The patient stated his firm belief in his having swallowed the plate, which was supported by the statement of the physician who first examined him. The urgency of the symptoms and the failure of esophageal exploration by instruments prompted immediate operation. An X-ray examination apparently demonstrated the teeth at the level of the superior internal angle of the scapula. Gastrotomy was done, also an esophagotomy, but the pharynx, gullet, and stomach were readily demonstrated to be free and clear. Mean-

while another search revealed the teeth in an obscure portion of the patient's room. Death from exhaustion came on about fifteen hours after the operation. The autopsy revealed an extraordinary degree of calcification of the larynx, particularly the posterior wall and cornua. There was marked atheroma of the arteries, the arch of the aorta being very dense and affording a shadow in the X-ray examination, which was readily misinterpreted. The case is believed by the author to be unparalleled in the extraordinary sequence of corroborative evidence. He thinks that the teeth were undoubtedly swallowed, but ejected unnoticed during a coughing paroxysm. The patient continued his struggles, believing they had not been dislodged, and mistook the hyoid bone for the plate.

The writer has collected 149 cases of this character from the literature, and believes that the experience of many surgeons shows that exploration with various sounds is an uncertain means of diagnosis. The X-rays must be classed among the accessory means of diagnosis, but are not infallible. Doctors and patients have often mistaken the cornua of the hyoid bone and the framework of the larynx for artificial teeth. Teeth have been swallowed without the patient's knowledge. The mortality rate for the non-operative treatment is three times as high as for the operative, and each day of delay increases the danger. The author concludes, considering even his own experience, that upon diagnosis prompt removal with or without surgical intervention is indicated.—*Medical News*.

HINTS, QUERIES, AND COMMENTS.

BROKEN FACINGS.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In the April COSMOS I see a small exchange in regard to replacing broken facings to bridges without removal of bridge, by the use of cement.

I have seen several articles from time to time advising cement and other things, but have never seen my method given anywhere. It is as follows: As anyone else would do, I take and fit tooth to bridge and grind if needed; then I drill holes for pins, and bevel or dovetail the holes toward each other, on the under or palatal side. Then I place my

tooth on the bridge with the pins in the holes and take a pair of pliers and draw or bend the pins toward each other. By that means one gets the facing to fit the bridge well. Then I dry thoroughly with hot air and pack gold foil in the holes and over the pins. Of course I use hand pressure entirely in condensing the gold. Finish as with any other gold filling, and one has a pretty piece of work, in harmony with the bridge, and a surface that is smooth to the tongue and one on which the saliva will not act.

Yours truly,

CHAS. E. JACKSON.

MIDLOTHIAN, TEX., April 7, 1903.

OBITUARY.

DR. STEWART BAILEY PALMER.

DIED, at his home, 161 Garfield avenue, Syracuse, N. Y., March 30, 1903, of uremia, Dr. STEWART BAILEY PALMER.

One of the best known and most generally beloved and respected practitioners of dentistry in this country has closed his earthly career. He had been sick for about a month from nervous and other troubles, but finally succumbed to an acute attack of uremia.

Dr. Palmer was born in Pompey (now Lafayette), Onondaga county, on September 1, 1822. His father, Avery F. Palmer, was born in Stonington, Ct., where his ancestor Walter Palmer, from England, settled in 1629. His great-great-grandfather, Rev. Wait Palmer, was pastor of the first Baptist church of North Stonington in 1743.

Although the country district school and his private study, with the exception of one term in Cortland Academy, were the places where his education was obtained, he added thereto by close application in certain lines of private study, including physics. Chemistry and electricity, at that early day, were to him very fascinating branches. His labor being on a farm remote from even a village, gave many evenings for study and experimenting.

He left school in the fall of 1846 and in the winter of 1847 taught district school in Tully. To aid in furnishing apparatus for study and amusement, most of the apparatus illustrated in Comstock's philosophy, the text-book of physics of the time, was made from the cuts there given, even to the construction of the steam engines in working models, the electric machine and galvanic batteries. To do this required many small tools, a small forge and bellows and a lathe. The knowledge thus gained was soon put to a practical test.

He was so unfortunate as to suffer from poor teeth, and consequently had nine teeth removed by an itinerant dentist, with a view of having an artificial denture at the proper time. In a few months he went to Syracuse and made inquiry respecting cost, which seemed to be almost beyond his means. Up to that time he had never seen a dental plate of

teeth, but after having closely inspected one being worn, he determined to make the needed plate for himself,—before having been in a dental laboratory or knowing a dentist except the one who did the extracting. He went to a druggist in Syracuse who kept a limited supply of dental material, and there found a work on operative and mechanical dentistry in which the cuts were well executed and clearly defined. By borrowing a part of the money the book was bought for five dollars, and on reaching his home the study of dentistry was commenced.

With the knowledge of the use and manufacture of tools and the aid of illustrations of things needed, the study became interesting and progressive. After a few weeks models and casts had been prepared ready for selection of the teeth. By the aid of the clerk the teeth were adjusted to the model and material bought to complete the case. The plate was made from silver coin hammered out upon the anvil, considerable time being required, but the plate was even and of the standard gauge as though it had been passed through a mill. More than six months elapsed before its completion, as general farm work and attention to a saw mill in connection claimed most of his time. The work was well done and the fit was satisfactory and did good service. A few years later it was superseded by a gold plate.

Not until he had made two or three plates for friends and made instruments for filling and practiced in that line for family and friends had he any idea of becoming a dentist.

In the year 1848 he went into the office of Dr. John L. Allen of Fabius, and he began practice in Lafayette in 1850. In the same year he married Miss Elizabeth J. Savery, now deceased.

In 1851 he moved to Tully and remained in practice until 1866, when he returned to Syracuse and entered into partnership with Dr. Amos Westcott. In 1868 he opened an office and there continued without change up to the time of his retirement.

As has been said, his education was continuous throughout life, stimulated by a desire

for knowledge and aided by dental literature and attendance upon dental meetings. Early in his practice he became a member of the first available dental society, the American Dental Convention, which held annual meetings in various places and which gave the opportunity to become acquainted with the representative dentists of different states. This association, which was free to all for membership, having fulfilled its mission, was succeeded by the American Dental Association, a delegated body of which he became a member in 1869, which membership he always retained.

In 1876 he was elected a member of the New York Odontological Society and was a member at the time of his death. He was active in the organization in 1858 of the Dental Society of the State of New York and retained membership, never having missed one of its meetings. In 1868 he received the State Society diploma, the degree of Master of Dental Surgery.

He was also a member of the Fifth District Dental Society of the State of New York, which embraced six counties in the state and which was organized in 1864. Until 1897 he had not failed to attend the annual or semi-annual meeting of this society in a single year. He was also connected with the Syracuse Dental Society and held office in that organization several times.

In 1872 he was elected to the State Board of Censors to fill the vacancy caused by the death of Dr. Amos Westcott. To this office he was re-elected, without another name in nomination, until 1895, when, by a legislative enactment giving the power of granting licenses to practice dentistry in the state to the Regents of the University of the State of New York, he was at once appointed by them upon the State Board of Dental Examiners, representing the New York Dental Society in the University of the State of New York. His official duties in examining for registrations brought him in contact and correspondence with a large number of young dentists, in whom he took a deep interest.

He was a contributor to dental literature on original subjects which gave him a national reputation. The work which brought him most prominently before the dental profession was the enunciation of his electro-chemical theory of tooth-decay, about 1876, which also

served as one of the fundamental features of the "new departure" creed promulgated shortly afterward under the leadership of Drs. Palmer, J. Foster Flagg, and Henry S. Chase. It was upon Dr. Palmer's theory that "failure in operations is mainly due to incompatibility of filling material with tooth-bone" became an important article of the "new departure" creed. While Dr. Palmer's theory cannot be said to have been generally accepted, it is nevertheless certain that his work and that of his colleagues in popularizing the intelligent and judicious use of plastic fillings has been of inestimable benefit in furthering the ends of conservative dentistry. Not only that; it has stimulated the study of plastic filling materials and improved their properties and range of practical usefulness.

Dr. Palmer was a conspicuous type of the true Christian gentleman: kindly in manner, gentle and charitable in disposition, always the champion of the right as he saw the right, helpful to all who desired his help, and honest in purpose and deed. He was a tower of strength in his profession, for whether his views brought conviction or not, he stimulated his hearers to think. He was a born student, a close observer of nature, and an impressive teacher. Truly a good man and helpful worker has gone from among us.

His funeral was largely attended by his friends and professional colleagues. Delegations representing the National Dental Association, New York State Dental Society, the Fourth, Fifth, and Seventh District Dental societies, the New York Institute of Stomatology, the New York Board of Dental Examiners, and the Syracuse Dental Society were present.

The surviving members of Dr. Palmer's family are a brother and three sisters.

DR. OTTO ARNOLD.

DIED, April 1, 1903, at Columbus, Ohio, of tuberculosis, Dr. OTTO ARNOLD, in the forty-ninth year of his age.

Dr. Arnold had been in failing health for some time and his death was not unexpected by those who were familiar with his condition. Nevertheless, the courageous struggle which he made against the fatal malady to which he finally succumbed, and his apparently hopeful

attitude of mind regarding it, encouraged his friends in the hope that he would be long spared to them. His death, therefore, brings with it a sense of shock and loss to all who were associated with him.

Dr. Arnold was born in Buffalo, N. Y., April 21, 1854. He began the study of dentistry under Dr. Sloan in 1874, and in 1879 was graduated from the Ohio College of Dental Surgery. He began the practice of his profession at Ironton, Ohio, subsequently removing his office to Columbus, where he established an enviable reputation as a conscientious and skillful operator. His abilities as a teacher were recognized by his election as dean of the Dental Department of the Ohio Medical University in 1897, a position which he held until last year.

Dr. Arnold was a delegate to the International Medical Congress at Berlin in 1890, and was president of the Ohio State Dental Society at its annual meeting held in Columbus in 1902.

He was an occasional contributor of thoughtful, practical articles to dental literature, and was one whose teachings, whether in the classroom, association, or journal, always commanded respectful attention. Kindly and courteous in his bearing, genial and sympathetic in his relations to his friends and *clientèle*, his loss at the height of his social and professional usefulness will be keenly felt by a wide circle of friends and acquaintances.

Dr. Arnold was married at Ironton, Ohio, in 1882, to Miss Jessie Jordan, who, with one daughter, survives him.

DR. EDWARD NELSON.

DIED, February 7, 1903, at his home in Frederick, Md., of organic disease of the heart, EDWARD NELSON, D.D.S.

Dr. Nelson was born in Frederick, Md., February 24, 1841, and began the study of his

profession under the preceptorship of Dr. Lloyd T. Macgill in 1861. He was graduated from the Baltimore College of Dental Surgery in 1863, and that year began the practice of his profession in his native town. His high qualifications were practically recognized by his appointment for three terms as a member of the Maryland State Board of Dental Examiners, a position which he held up to the time of his decease. Dr. Nelson was a member of the Maryland State Dental Society and the Odontological Society, and an occasional lecturer and writer upon dental topics.

He was married in 1871 to Miss Harriet Murdoch Wilson of Frederick, who, with one son, survives him.

At a special meeting of the Maryland State Board of Dental Examiners the following resolutions were adopted:

WHEREAS, Our Heavenly Father in His divine wisdom has seen fit to remove from the sphere of his earthly labors our esteemed friend and brother Examiner, Dr. EDWARD NELSON, of Frederick, Md.; and

WHEREAS, By his death the Maryland Board of Dental Examiners has been deprived of a valued member; therefore

Resolved, That in his association with the members of this board he ever displayed a kindness of nature and generosity of heart which will always be remembered with the warmest affection.

Resolved, That as an examiner he displayed wonderful ability, good judgment, and tact in the performance of his official duties.

Resolved, That the board in special session hereby extends its heartfelt sympathy to his bereaved family in their sad affliction.

Resolved further, That these resolutions be spread upon the minutes of the board and published in the dental journals and *Baltimore Sun*, and that a copy be forwarded to the family of the deceased.

F. F. DREW, D.D.S., *Sec'y*.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS: May, June, and July 1903.

MAY.

AMERICAN MEDICAL ASSOCIATION: SECTION ON STOMATOLOGY. New Orleans. May 5th to 8th.

ALABAMA DENTAL ASSOCIATION. Birmingham. May 13th.

ARKANSAS STATE DENTAL ASSOCIATION. Little Rock. Three days: May 12th, 13th, and 14th.

FLORIDA STATE DENTAL SOCIETY. Seabreeze Beach. May 27th.

ILLINOIS STATE DENTAL SOCIETY. Bloomington. May 12th, 13th, and 14th.

INDIANA (EASTERN) DENTAL ASSOCIATION. Elwood. May 13th and 14th.

IOWA STATE DENTAL SOCIETY. Sioux City. Three days: May 5th, 6th, and 7th.

KANSAS STATE DENTAL ASSOCIATION. Emporia. Three days: May 14th, 15th, and 16th.

KENTUCKY STATE DENTAL ASSOCIATION. Bowling Green. Three days: May 25th, 26th, and 27th.

OKLAHOMA DENTAL ASSOCIATION. Oklahoma City. Two Days: May 12th and 13th.

PENNSYLVANIA: SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA. Easton. May 13th, 14th, and 15th.

MARYLAND STATE DENTAL ASSOCIATION AND WASHINGTON, D. C., DENTAL SOCIETY UNION MEETING. Baltimore. Three days: May 21st, 22d, and 23d.

MISSISSIPPI DENTAL ASSOCIATION. Vicksburg, May 19th, 20th, and 21st.

MISSOURI STATE DENTAL ASSOCIATION. Kansas City. Three days: May 19th, 20th, and 21st.

NEBRASKA STATE DENTAL SOCIETY. Lincoln. May 19th to 22d.

NEW HAMPSHIRE DENTAL SOCIETY. Manchester. Three days: May 13th to 15th.

NEW YORK STATE DENTAL SOCIETY. Albany. Two days: May 13th and 14th.

NEW YORK—SIXTH DISTRICT DENTAL SOCIETY. Binghamton. Two days: May 7th and 8th.

PENNSYLVANIA: LAKE ERIE DENTAL ASSOCIATION. Cambridge Springs, Pa. Three days: May 19th, 20th, and 21st.

PENNSYLVANIA: LEBANON VALLEY DENTAL ASSOCIATION. Harrisburg. Two days: May 19th and 20th.

TEXAS STATE DENTAL ASSOCIATION. Houston. Three days: May 14th, 15th, and 16th.

WASHINGTON STATE DENTAL SOCIETY. Spokane. May 28th, 29th, and 30th.

WISCONSIN (SOUTHERN) DENTAL ASSOCIATION. Janesville. Two days: May 20th and 21st.

JUNE.

CALIFORNIA STATE DENTAL ASSOCIATION. San Francisco. Four days: June 9th to 12th.

COLORADO STATE DENTAL ASSOCIATION. Denver. Three days: June 16th to 18th.

CONNECTICUT ODONTOLOGICAL SOCIETY. New Haven. June 16th.

GEORGIA STATE DENTAL SOCIETY. Tallulah Falls. June 9th.

IDAHO STATE DENTAL SOCIETY. Boise City. June 9th.

INDIANA STATE DENTAL ASSOCIATION. Indianapolis. Three days: June 30th, July 1st and 2d.

MASSACHUSETTS DENTAL SOCIETY. Boston. Two days: June 3d and 4th.

NORTH CAROLINA DENTAL SOCIETY. Winston. Three days: June 17th, 18th, and 19th.

JULY.

MAINE DENTAL SOCIETY. Kineo, Moosehead Lake. Three days: July 21st, 22d, and 23d.

MICHIGAN DENTAL SOCIETY. Petosky, Mich. Date not yet announced.

NATIONAL DENTAL ASSOCIATION. Asheville, N. C. July 28th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. Asheville, N. C. July 24th, 25th, and 26th.

NATIONAL ASSOCIATION OF COLORED DENTISTS. Washington, D. C. Three days: July 2d, 3d, and 4th.

NEW JERSEY STATE DENTAL SOCIETY. Asbury Park. Three days: July 15th, 16th, and 17th.

PENNSYLVANIA STATE DENTAL SOCIETY. Wilkesbarre. Three days: July 7th to 9th.

RHODE ISLAND DENTAL SOCIETY. Newport. July 14th.

TENNESSEE STATE DENTAL ASSOCIATION. Lookout Mountain. July. (Exact date not yet announced.)

VIRGINIA STATE DENTAL ASSOCIATION. Hot Springs, Va. July 22d, 23d, and 24th.

WISCONSIN STATE DENTAL SOCIETY. West Superior. July 21st, 22d, and 23d.

State Board Meetings.

ALABAMA STATE BOARD OF DENTAL EXAMINERS. Birmingham. May 11th.

ARKANSAS STATE BOARD OF DENTAL EXAMINERS. Little Rock. May 12th, 13th, and 14th.

CONNECTICUT DENTAL COMMISSION. Hartford. May 21st, 22d, and 23d.

DELAWARE STATE BOARD OF DENTAL EXAMINERS. Wilmington. July 1st.

DISTRICT OF COLUMBIA BOARD OF DENTAL EXAMINERS. Washington, D. C. July 14th.

FLORIDA STATE BOARD OF DENTAL EXAMINERS. Seabreeze. May 26th.

GEORGIA STATE BOARD OF DENTAL EXAMINERS. Tallulah Falls. June 9th.

INDIANA STATE BOARD OF DENTAL EXAMINERS. Indianapolis. June 9th.

KANSAS STATE BOARD OF DENTAL EXAMINERS. Kansas City, Kan. May 4th to 8th.

KENTUCKY STATE BOARD OF DENTAL EXAMINERS. Bowling Green. May 25th.

LOUISIANA STATE BOARD OF DENTISTRY. New Orleans. May 5th.

MAINE STATE BOARD OF DENTAL EXAMINERS. Portland. June 24th.

MARYLAND STATE BOARD OF DENTAL EXAMINERS. Baltimore. May 6th and 7th.

MASSACHUSETTS BOARD OF REGISTRATION IN DENTISTRY. June 24th to 26th.

MICHIGAN STATE BOARD OF DENTAL EXAMINERS. Grand Rapids. May 12th.

MISSISSIPPI STATE BOARD OF DENTAL EXAMINERS. Jackson. May 26th.

MISSOURI STATE BOARD OF DENTAL EXAMINERS. Jefferson City. May 12th.

MONTANA STATE BOARD OF DENTAL EXAMINERS. Helena. June 16th, 17th, and 18th.

NEW JERSEY STATE BOARD OF REGISTRATION AND EXAMINATION IN DENTISTRY. Trenton. July 7th to 9th.

NORTH DAKOTA BOARD OF DENTAL EXAMINERS. Grand Forks. July 10th.

NORTH CAROLINA STATE BOARD OF DENTAL EXAMINERS. Winston. June 15th.

OHIO STATE BOARD OF DENTAL EXAMINERS. Columbus. June 30th, July 1st and 2d.

OKLAHOMA BOARD OF DENTAL EXAMINERS. Oklahoma City. May 11th and 12th.

PENNSYLVANIA STATE BOARD OF DENTAL EXAMINERS. Philadelphia and Pittsburg. June 9th to 12th.

RHODE ISLAND BOARD OF REGISTRATION IN DENTISTRY. Providence. June 29th.

SOUTH DAKOTA STATE BOARD OF DENTAL EXAMINERS. Lead. May 13th and 14th. Also at Redfield, June 2d and 3d.

VERMONT BOARD OF DENTAL EXAMINERS. Montpelier. July 7th.

VIRGINIA STATE BOARD OF DENTAL EXAMINERS. Richmond. June 9th.

WEST VIRGINIA STATE BOARD OF DENTAL EXAMINERS. Charleston. June 3d, 4th, and 5th.

WASHINGTON STATE BOARD OF DENTAL EXAMINERS. Spokane. May 21st.

AMERICAN MEDICAL ASSOCIATION—SECTION ON STOMATOLOGY.

FOLLOWING is the program of the Section on Stomatology, American Medical Association, meeting in New Orleans, La., May 5-8, 1903:

1. Chairman's Address: M. L. Rhein, New York city.

2. Symposium on the Dental Pulp: (a) "Notes on Pulp Technique," Martha Anderson, Moline, Ill. (b) "Minute Structures of the Dental Pulp," Vida A. Latham, Chicago. (c) "The Vaso-Motor System," Eugene S. Talbot, Chicago. (d) "The Dental Pulp Viewed Without the Microscope," T. E. Constant, Scarborough, England. (e) (Subject to be announced), J. Choquet, Paris, France. (f) "The Development of Hard Tissue in the Pulp," D. E. Causch, Brighton, England. (g) "Some Histological Facts Contradictory to the Theory of Odontoblasts," Michael Morgenstein, Strasburg, Germany. (h) "Pulp Hypertrophy of the Teeth," Oscar Roemer, Strasburg, Germany. (i) "Tolerance of Tissues for Foreign Bodies, with Special Reference to the Pulp and Peridental Membrane," M. H. Fletcher, Cincinnati.

3. "Professional Responsibilities," A. E. Baldwin, Chicago.

4. "The Dental Symptoms of Diabetes Mellitus," Hermann Prinz, St. Louis.

5. "Germicides," A. H. Peck, Chicago.

6. "A System for the Correction of Hare-lip and Cleft Palate," G. V. I. Brown, Milwaukee.

7. "Is the Accomplishment of Reasonable Ideals in Dental Education Near at Hand?" Chas. Chittenden, Madison.

8. "The Influence of Local and General Disturbance upon the Oral Secretions," Geo. F. Eames, Boston.

9. "The Dentist in the United States Navy," Richard Grady, Baltimore, Md.

10. "Methods of Controlling Hemorrhage of the Oral Cavity," H. E. Belden, New Orleans, La.

11. "Empyema of the Maxillary Sinus," O. N. Heise, Cincinnati.

12. "Medical and Dental Libraries," Alice M. Steeves, Boston.

13. "Orthodontic Facial Orthopedia," W. E. Walker, New Orleans, La.

M. L. RHEIN, New York city, *Ch'man.*

EUGENE S. TALBOT, Chicago, *Sec'y.*

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will meet at Asheville, N. C., July 24, 25, and 27, 1903.

J. P. ROOT, *Sec'y.*

NEW YORK STATE DENTAL SOCIETY.

THE thirty-fifth annual meeting of the New York State Dental Society will be held in the assembly hall, Hotel Ten-Eyck, Albany, N. Y., May 13 and 14, 1903.

Special rates have been secured at the hotel; also special railroad rates on the certificate plan on all railroads.

The business committee have arranged the following program: President's Address, R. H. Hofheinz, Rochester, N. Y. Report of Correspondent, H. D. Hatch, New York city. Report of Committee on Practice, A. R. Cooke, Syracuse, N. Y. Papers: (Subject to be announced), E. C. Kirk, Philadelphia. "Two Crowns" (an illustrated talk), R. M.

Sanger, East Orange, N. J. (Subject to be announced), J. Ed. Line, Rochester, N. Y. "The Trained Dental Nurse," M. L. Rhein, New York city. "Practical Demonstration of the Roentgen Rays in Dentistry," F. T. Van Woert, Brooklyn, N. Y. "Construction of Inlays Without a Furnace," J. F. Knapp, Geneva, N. Y.

R. H. HOFHEINZ, *Pres.*, Rochester, N. Y.

W. A. WHITE, *Sec'y*, Phelps, N. Y.

SIXTH DISTRICT DENTAL SOCIETY.

THE thirty-fifth annual meeting of the Sixth District Dental Society of the State of New York will be held on Thursday and Friday, May 7 and 8, 1903, at Hotel Bennett, Binghamton, N. Y.

FRED. W. MCCALL, *Sec'y.*

EASTERN INDIANA DENTAL ASSOCIATION.

CHANGE OF DATE OF MEETING.

THE Eastern Indiana Dental Association will hold its annual meeting at Elwood, Ind., May 13 and 14, 1903. Efforts are being made to have a large and profitable meeting. Prominent members of the profession will present papers and the clinics will be of special interest. All members of the profession are cordially invited.

P. H. CHADWICK, *Sec'y*, Rushville, Ind.

NEBRASKA STATE DENTAL SOCIETY.

THE Nebraska State Dental Society will hold its annual meeting in Lincoln, Neb., May 19-22, 1903.

The profession cordially invited.

H. R. HATFIELD, *Cor. Sec'y.*

TEXAS STATE DENTAL ASSOCIATION.

THE Texas State Dental Association will hold its twenty-third annual meeting in the city of Houston, May 14, 15, and 16, 1903. This meeting promises to be the best ever held in Texas. All members of the profession are invited to attend.

BUSH JONES, *Sec'y*, Dallas, Tex.

NEW HAMPSHIRE DENTAL SOCIETY.

THE annual meeting of the New Hampshire Dental Society will be held at Manchester, N. H., in the Board of Trade rooms, on May 13, 14, and 15, 1903. All members of the profession are cordially invited to be present.

FRED. F. FISHER, *Sec'y*.

KENTUCKY STATE DENTAL ASSOCIATION.

CHANGE OF DATE OF MEETING.

THE Kentucky State Dental Association will hold its annual meeting May 25, 26, and 27, 1903, at Bowling Green.

C. R. SHACKLETTE, *Sec'y*,
636 Fourth ave., Louisville, Ky.

KANSAS STATE DENTAL ASSOCIATION.

THE Kansas State Dental Association will hold its regular annual meeting on Thursday, Friday, and Saturday, May 14, 15, and 16, 1903, at Emporia, Kan.

G. A. ESTERLY, *Sec'y*, Lawrence, Kan.

ARKANSAS STATE DENTAL ASSOCIATION.

THE Arkansas State Dental Association will meet in Little Rock, Ark., May 12, 13, and 14, 1903.

W. T. ROWLAND, *Sec'y*.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

THE Southern Wisconsin Dental Association will hold its annual meeting at Janesville, Wis., May 20 and 21, 1903.

Every effort is being made to have a large and interesting meeting. Prominent members of the profession will present papers, and some of the most noted clinicians will operate.

All reputable members of the profession are cordially invited.

C. W. COLLVER, *Sec'y*, Clinton, Wis.

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA.

THE fifty-fifth annual meeting of the Susquehanna Dental Association of Pennsylvania will be held at the United States Hotel, Easton, Pa., May 13, 14, and 15, 1903.

Every effort is being made to have a large and interesting meeting. Prominent members of the profession will present papers, and noted clinicians will operate.

All reputable members of the profession are cordially invited.

J. C. HERTZ, *Ch'man Ex. Com.*,
Easton, Pa.

MISSOURI STATE DENTAL ASSOCIATION.

THE thirty-ninth annual meeting of the Missouri State Dental Association will be held at Kanas City, Mo., May 19, 20, and 21, 1903.

Reduced railroad and hotel rates have been secured, and a very large attendance is assured.

A number of dentists of national reputation—among them Drs. J. B. Willmott, Toronto, Canada (prosthetic dentistry), E. K. Wedelstaedt, St. Paul, Minn. (operative dentistry), and A. C. Searle, Owatonna, Minn. (clinic operator),—will present papers and give clinics.

The following is a partial program: President's Annual Address, S. C. A. Rubey, Clinton, Mo. "Some Doubts On Anesthesia," T. W. Arnold, Butler, Mo. "When and How Shall I Brush My Teeth?" B. Q. Stevens, Hannibal, Mo. "Mutilation of Teeth," W. M. Carter, Sedalia, Mo. "Cavity Linings—Method of Protecting the Cervical Margins in Cement Fillings," Burton Lee Thorpe, St. Louis, Mo. "Forming a Cavity," G. W. Musgrave, Ash Grove, Mo. (Subject to be announced), Chas. L. Hungerford, Kansas City, Mo. "Combination Fillings," D. J. McMillen, Kansas City, Mo. "Lower Dentures," R. C. Brophy, Chicago, Ill. Table Clinic—"Seamless Crowns and Gold Inlays," Otto J. Fruth, St. Louis, Mo. Table Clinic—"Xylonite Plates," Henry B. Purl, Kirksville, Mo. Table Clinic—(subject to be announced), Ed. S. Brown, Edina, Mo. Table clinic—"Restoration of Lost Expression by Artificial Dentures," W. H. DeFord, Jefferson, Iowa. Op-

erative Clinic—"Anesthetize and Extract Dental Pulp, Using Aseptic Broaches; Fill Canals, Demonstrating the Use of Oleo-Percha," L. A. Young, St. Louis, Mo. Operative Clinic—"Gold and Amalgam Fillings Without Undercut or Retaining Pits. Or, Cement Cavity-Lining; Soft Cement," J. J. Brown, Macon, Mo. Table Clinic—"Orthodontia," A. J. McDonald, Kansas City, Mo. Operative Clinic—"Painless Pulp-Extraction and Immediate Canal-Filling," R. M. Seibel, Kansas City, Mo. Operative Clinic—"Oral Surgery," E. B. Moorehead, Chicago, Ill. Operative Clinic—"Removable Canal-Filling," P. H. Morrison, St. Louis, Mo. Table Clinic—"Prosthetic Aids," E. P. Dameron, St. Louis, Mo. Operative and Table Clinic—"Combination Fillings," D. L. McMullen, Kansas City, Mo. Table Clinic—"A Cast Lower Plate," R. C. Brophy, Chicago, Ill. Table Clinic—"Shell and Bridge with Cogswell Crown," W. J. Lark, St. Louis, Mo. Operative Clinic—"Porcelain Inlay. Jenkins System," K. P. Ashley, Kansas City, Mo.

All ethical members of the profession are cordially invited to attend, become members, and take part in the discussions.

OTTO J. FRUTH, *Cor. Sec'y*,

3066 Hawthorne Boulevard, St. Louis, Mo.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE Pennsylvania State Dental Society will hold its thirty-fifth annual meeting at Wilkesbarre, Pa., July 7, 8, and 9, 1903. An interesting and varied program has been arranged, and a large attendance is assured.

C. V. KRATZER, *Sec'y*.

MASSACHUSETTS DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Massachusetts Dental Society will be held in Boston, in Mechanics Building, on Wednesday and Thursday, June 3 and 4, 1903.

EDGAR O. KINSMAN, *Sec'y*,
Cambridge, Mass.

ILLINOIS STATE DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Illinois State Dental Society will be held in

Bloomington, May 12, 13, and 14, 1903. A large program of interesting essays and clinics has been prepared, and a splendid meeting is expected.

The railroads throughout the state and from St. Louis will make a rate of a fare and one-third, certificate plan, for the round trip. All are cordially invited. Remember the date.

A. H. PECK, *Pres.*

HART J. GOSLEE, *Sec'y*.

LEBANON VALLEY DENTAL ASSOCIATION.

THE twenty-eighth annual meeting of the Lebanon Valley Dental Association will be held at Harrisburg, May 19 and 20, 1903.

The program is a very good one.

Come, and bring something of interest with you. A general invitation is hereby extended.

H. W. BOHN, *Chairman*.

INDIANA STATE DENTAL AS- SOCIATION.

THE forty-fifth annual meeting of the Indiana State Dental Association will be held at Indianapolis, June 30, July 1 and 2, 1903. A splendid program is being arranged by the executive committee, and a most cordial welcome will be extended to those who attend.

F. R. McCLANAHAN, *Sec'y*.

CALIFORNIA STATE DENTAL ASSOCIATION.

THE thirty-second annual meeting of the California State Dental Association will be held in San Francisco, beginning June 9th and continuing for four days. A large attendance is expected, the committee having furnished an excellent program.

O. P. ROLLER, *Cor. Sec'y*.

CONNECTICUT ODONTOLOGI- CAL SOCIETY.

THE Connecticut Odontological Society will hold its third annual meeting at the Young Men's Republican Club, corner of Crown and Temple streets, New Haven, Conn., on Tuesday, June 16, 1903, beginning at 10.30 A.M.

J. HAMMOND MALLERY, *Ch'man Ex. Com.*,

26 State st., Hartford, Conn.

MAINE DENTAL SOCIETY.

THE thirty-eighth annual meeting of the Maine Dental Society will be held at Kineo, Moosehead Lake, July 21, 22, and 23, 1903.

This is an ideal opportunity to visit this beautiful spot, the most attractive summer resort in the state.

All dentists are cordially invited to meet with us, and we especially extend an invitation to those who are natives of Maine to participate in a pleasant and profitable reunion. We are to have papers and clinics by men of national reputation, including Dr. L. P. Haskell of Chicago, Dr. W. A. Capon of Philadelphia, and Dr. R. Ottolengui of New York.

The Mount Kineo House accommodates five hundred guests and grants us half rates on this occasion.

Reduced railroad rates from Portland.

C. H. HAINES, *Ch'man Ex. Com.*,
Dexter, Me.

E. K. WEDELSTAEDT DENTAL CLUB OF IOWA.

THE E. K. Wedelstaedt Dental Club of Iowa was organized at Cedar Rapids, Iowa, December 17, 1902.

This club has a limited membership, and will be devoted to the exclusive study of operative dentistry according to the Black-Wedelstaedt methods.

The next meeting will be held at Clear Lake, Iowa, in July.

Officers: W. R. Clack, president; J. V. Conzett, Dubuque, vice-president; Wm. Finn, Cedar Rapids, secretary and treasurer.

W. R. CLACK, *Pres.*

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

At the annual meeting of the Central Dental Association of Northern New Jersey, held at Newark, February 16, 1903, the following officers were elected: Wm. H. Pruden, president; C. W. Hoblitzell, vice-president; Chas. A. Meeker, treasurer; Fred. W. Stevens, secretary. Executive Committee—J. A. Voorhees, Frank Manning, J. S. Vinson, W. W. Hawke, and J. S. Dunning.

FRED. W. STEVENS, *Sec'y.*

WASHINGTON DENTAL CLUB.

THE Washington Dental Club, Washington, D. C., was organized in February, 1902.

Officers: Wm. Donnally, president; M. F. Finley, secretary-treasurer. Members: H. B. Noble, R. B. Donaldson, R. H. Gunnell, H. C. Thompson, J. Hall Lewis, H. J. Allen, R. W. Talbott, W. N. Cogan, Sheldon G. Davis, Shirley W. Bowles.

NEW ORLEANS ACADEMY OF STOMATOLOGY.

THE annual meeting of the New Orleans Academy of Stomatology was held in the assembly room of the New Orleans College of Dentistry on Wednesday, March 11, 1903.

After the transaction of routine business and the reading of interesting papers the following officers were elected to serve for the ensuing year: H. P. Magruder, president; J. H. Landry, vice-president; Paul DeVerges, secretary and treasurer. Executive Committee—L. D. Archinard, C. V. Vignes, and V. K. Irion.

The Academy meets on the fourth Wednesday of each month.

The essayist for the next meeting will be Dr. M. R. Fisher.

PAUL DEVERGES, *Sec'y.*

DENTAL COMMISSIONERS OF CONNECTICUT.

THE Dental Commissioners of the state of Connecticut will meet at Hartford, on Thursday, Friday, and Saturday, May 21, 22, 23, 1903, to examine applicants for license to practice dentistry.

The practical examination in operative and prosthetic dentistry will be held Thursday, May 21st, at 9 A.M., in the Armory, corner Haynes and Pearl streets. The written theoretic examination will be held Friday and Saturday, May 22d and 23d, at the Capitol.

All applicants should apply to the Recorder for proper blanks, and for the revised rules for conducting the examinations. Application blanks must be carefully filled in and sworn to, and with fee, twenty-five dollars, filed with the Recorder on or before May 16, 1903.

J. TENNEY BARKER, *Recorder*,
Wallingford.

OHIO BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of the State of Ohio will meet at the Hartman Hotel, Columbus, June 30, July 1 and 2, 1903, for the purpose of examining candidates for certificates of registration.

All applications should be filed with the secretary by June 20th.

For further particulars address

H. C. BROWN, *Sec'y*,
12 E. Broad st., Columbus, Ohio.

SOUTH DAKOTA STATE BOARD OF DENTAL EXAMINERS.

THE next meeting of the South Dakota State Board of Dental Examiners will be held at Lead, S. D., May 13 and 14, 1903, beginning promptly at 9 A.M. No candidates for examination will be received after 9 A.M. on the 13th. Those desiring to attend this meeting should take advantage of the Oddfellows' State Convention excursion rates. This excursion leaves Sioux City on May 11th, at 7.30 P.M.

The board will also hold a meeting at Redfield, S. D., June 2 and 3, 1903. No candidates for examination will be received at this meeting after 9 A.M. on the 2d.

All candidates taking these examinations should come prepared to insert gold, silver, and cement fillings.

The South Dakota Dental Society meeting will be held at the same place June 3d, 4th, and 5th.

G. W. COLLINS, *Sec'y*,
Vermillion, S. D.

ARKANSAS BOARD OF DENTAL EXAMINERS.

THE Arkansas State Board of Dental Examiners will meet in Little Rock, Arkansas, May 12, 13, and 14, 1903, for the purpose of examining applicants who may desire to practice dentistry in the state of Arkansas. It will be necessary for all applicants to come prepared to stand examination, whether they hold a diploma or not.

J. M. FLENNIKEN, *Pres.*
W. H. MARSHALL, *Sec'y*.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburg, June 9 to 12, 1903.

Address the Dental Council, Harrisburg, Pa., for application papers and further particulars.

G. W. KLUMP, *Sec'y*,
Williamsport, Pa.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination on Tuesday, Wednesday, and Thursday, July 7, 8, and 9, 1903, in the assembly room of the Statehouse at Trenton, N. J.

Session begins promptly at 9 A.M.

All applications must be in the hands of the secretary ten days prior to the examination.

J. ALLEN OSMUN, *Sec'y*.

WEST VIRGINIA STATE BOARD OF DENTAL EXAMINERS.

THE West Virginia State Board of Dental Examiners will hold its regular spring meeting for examinations on June 3, 4, and 5, 1903, at Charleston, W. Va. For further particulars address

W. A. WILLIAMS, *Sec'y*,
Huntington, W. Va.

WASHINGTON STATE BOARD OF DENTAL EXAMINERS.

THE Washington State Board of Dental Examiners hold stated meetings in May and November of each year.

At the meeting held in Tacoma, May 1903, the following officers were elected: A. B. Bailey, Spokane, president; Geo. W. Stryker, Everett, corresponding secretary and treasurer.

Next meeting will be at Spokane, Wash., May 21, 1903.

GEO. W. STRYKER, *Sec'y*, Everett, Wash.

MASSACHUSETTS BOARD OF REGISTRATION.

THE next meeting of the Massachusetts Board of Registration in Dentistry for the examination of applicants will be held June 24, 25, and 26, 1903.

Application blanks and all necessary information furnished by the secretary.

G. E. MITCHELL, *Sec'y*,
25 Merrimack st., Haverhill, Mass.

FLORIDA BOARD OF DENTAL EXAMINERS.

THE Florida State Board of Dental Examiners will met at Seabreeze, Fla., on the 26th day of May 1903. All applicants for examination are requested to be present on that date.

E. M. SANDERSON, *Sec'y*.

COLORADO BOARD OF DENTAL EXAMINERS.

THE membership and officers of the Colorado State Board of Dental Examiners are now as

follows: F. H. Sutherland, Majestic Bldg., Denver, Col., president; M. S. Fraser, Mack Block, Denver, Col., secretary; George R. Warner, Grand Junction, Col., treasurer; M. H. Smith, Denver, Col.; Sara May Townsend, Denver, Col. Term of office for all ends April 1, 1905.

M. S. FRASER, *Sec'y*.

ARMY DENTAL CORPS.

PARAGRAPH 11, S. O. 76, April 1, 1903, H. Q. A., relating to Contract Dental Surgeon Alexander P. Bacon, is revoked. (April 6, H. Q. A.)

Contract Dental Surgeon Samuel W. Hussey, now at San Francisco, Cal., will report in person to the commanding general, Department of California, for duty. (April 4, H. Q. A.)

Contract Dental Surgeon Alden Carpenter, now at San Francisco, Cal., will proceed to Vancouver Barracks, Wash., for duty. (April 4, H. Q. A.)

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING MARCH 1903.

March 3.

- No. 721,655, to EDWARD H. ANGLE. Tooth regulator.
- No. 722,033, to WILLIAM A. McCARTER. Dental clamp.

March 17.

- No. 722,699, to WILLIAM H. HALL. Tooth-powder box.
- No. 722,726, to THEODORE G. LEWIS. Dental Flask-press.
- No. 722,765, to ANDREW S. STEIGERWALD. Dental flask.
- No. 723,102, to THOMAS H. WHITESIDE. Artificial tooth.
- No. 723,134, to ARTHUR W. BROWNE. Automatic mallet.
- No. 723,135, to ARTHUR W. BROWNE. Sleeve for flexible shaft.

March 24.

- No. 723,275, to JOHN HOOD. Dental flask.
- No. 723,384, to JULIUS HARRIS. Dental mandrel.
- No. 723,546, to JOHN W. PLACE. Dental crown-holder.
- No. 723,661, to DANIEL A. EVANS. Dental cabinet.
- No. 723,710, to HARRY T. McCUNE. Dentist's spreading-screw elevator.
- No. 723,802, to ASA W. STRAIGHT and GUSTIN B. STONE. Furnace.

March 31.

- No. 723,822, to ALBERT E. BUCHANAN. Syringe for dental or other uses.
- No. 723,872, to WILLY HOMANN. Dental hand-piece.
- No. 723,942, to WILLARD STREETMAN. Dental mold.
- No. 723,998, to JOHN H. FEAGAN. Dental flask.

THE DENTAL COSMOS.

VOL. XLV.

JUNE, 1903.

No. 6.

ORIGINAL COMMUNICATIONS.

PORCELAIN DENTAL ART.*

By Dr. CHARLES H. LAND, Detroit, Michigan.

(Read before the Odontological Society of Western Pennsylvania, at Pittsburg, March 10, 1903.)

PORCELAIN as applied in dentistry prior to the year 1885 was exclusively confined to the manufacture of artificial teeth and a few cavity-stoppers. The dawn of the new era, which revealed a field of greater scope and increased value, was first made known to the profession by the publication of an article in the *Independent Practitioner* of August 1886, entitled "A New System of Restoring Badly Decayed Teeth." Following this was another article, appearing in the February 1887 number of the same journal, entitled "Metallic Enamel Sections: a New System for Filling Teeth." In addition to this, an original paper, read before the Central Dental Association of Northern New Jersey, entitled "Metallic Enamel Coatings and Fillings," appeared in the August 1887 issue of the same journal.

All three articles were profusely illustrated, and, combined, they gave a very elaborate description, showing various forms of porcelain contours, fillings, crowns, and enamel caps—or the jacket crown. Especial attention was called to the metallic matrix as a means that

would enable one to practice a great variety of operations. This matrix was to be formed of any suitable metal, specifying either gold or platinum foil as being the most appropriate. Also the restored portions of the teeth, consisting of fillings, contours, or crowns, were to be composed of glass, porcelain, gold, silver, or rubber—in fact, of any suitable substance. Citing from my patents of 1887 and 1888, a part of the specifications declared that the object of the invention included "means for molding indestructible substances into sections corresponding in form to decayed portions of the teeth. A metallic matrix is formed by swaging or burnishing a thin metal into the cavity to secure an impression thereof. Any suitable metal is used, as platinum or gold. A matrix so constructed is filled with any suitable plastic substance, preferably porcelain, gold, glass, or rubber. The metal fitted to the cavity or a portion thereof may constitute a mold, and the section conformed thereto may be separated therefrom and engaged in the cavity without the mold. No pins in this case are required."

* Copyright, May 1903, by Charles H. Land, Detroit, Mich.

It may also be mentioned that before the issue of my American patents I had secured patents in Canada, France, Italy, Great Britain, Austria, Spain, and Belgium; that the German patent was refused in view of the illustrated descriptions published in the *Independent Practitioner* two years previous to the filing of the application, which fact made it public property according to the German patent law. It will also be well for me to state that my principal object in taking out foreign patents was with the view of preventing others importing and obtaining patents on my inventions in foreign countries, and then to make them public property. This was also my greatest desire for the United States, and by reference to those original articles you will find my sentiments publicly announced. Since then I have secured numerous other patents on the same basis, not because I expected to obtain royalties from my fellow practitioners, but wished to be permitted to practice my own inventions free from exorbitant tax. I am at least willing to pay the usual fee of sixty-five dollars for the sole purpose of being able to file expert specifications and thereby put them on reliable and official record. This establishes the prior and legal right to original investigations, and should at least debar the numerous individuals who flippantly declare they did it twenty years ago. Such persons generally lack the evidence or proof of their assertion.

PORCELAIN INLAYS.

With the advent of the metallic matrix, numerous other operations were rapidly developed. Some of them I consider of far more importance than the simple inlay. However, the mass of the profession seem inclined to concentrate the major portion of their attention upon this particular operation, granting but little time or consideration for the more important and wider field of opportunities found in contours, crowns, caps, and bridge work, all of which may be manipulated in porcelain with great satisfaction and be completely successful. Eighteen years of practice in all classes of

porcelain work has demonstrated that when an inlay is appropriate no other class of work will be as suitable in the same place; but where one opportunity of this nature is presented, fifty per cent. more is demanded in the other classes known as crowns, caps, contours, and bridge work. See illustrations A, B, C, and D.

Illustration E is a suitable example strongly indicating characteristic places for inlays, and yet when physiologically considered, and whether they are filled with gold, amalgam, gutta-percha, or inlays, the results are generally only very temporary. This class of cases is almost always due to erosion, and all who have practiced dentistry for many years know from experience that decay will rapidly extend, attacking all the remaining parts of sound tooth-structure left exposed; consequently I have found it more satisfactory to cover such examples entirely with enamel metallic caps, or to form a complete hood of porcelain. One other serious objection or weak point in the inlay system is the superficial washing out of the cement. No matter how perfect the work, in many instances stains will gradually collect between the inlay and the wall of the cavity, and before many months your patient will return and request you to remove the dirt from the joint. To overcome this trouble, it has been my practice to first line the cavity with gold foil and then fit my inlay, whereby the gold exposed would be reduced to a mere threadlike line, which is far less objectionable than the stained joint. Do not infer from this that I decry inlays altogether. Far from it, for there are many instances where the secretions of the mouth are favorable, and such objections are not apparent even after twelve and fourteen years of use.

One more valuable fact that has been proved: In contours and inlays where the metal matrix had not been removed, and where a very small amount of platinum had been permitted to overlap the edge of the cavity, I can say that after twelve, fourteen, and sixteen years of

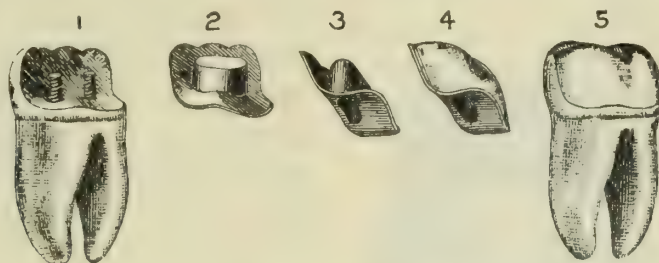
use it has been very gratifying to have my patients return year after year with all of this class of inlays and contours in the best condition, the threadlike edge of the platinum keeping its polish, and the

doubt a joint of this description is the most reliable.

That the cement does gradually dissolve out of the joints in a very large percentage of inlays is a proved fact. How-

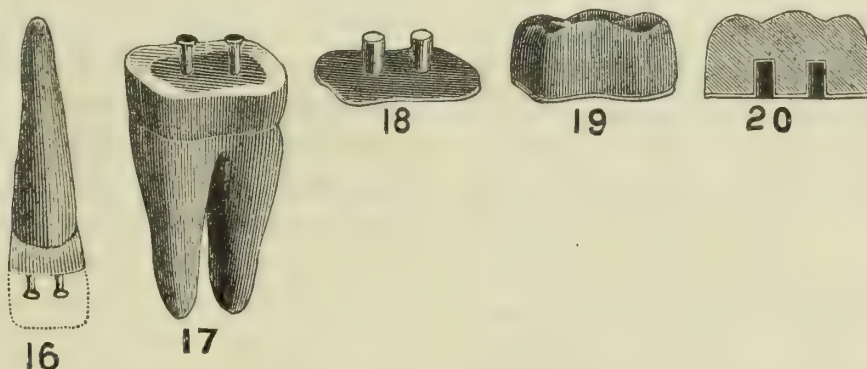
(A)

RESTORATION IN PORCELAIN ON GOLD FOUNDATIONS.



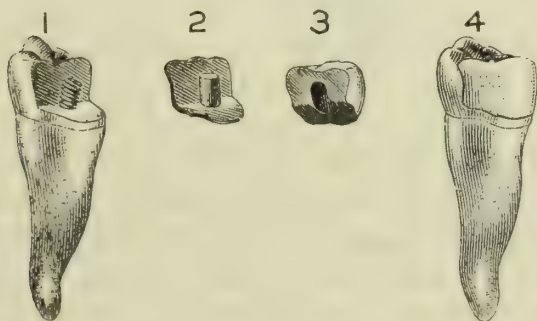
1. Illustrates gold posts anchored in the cavity by malleting gold foil about them and covering the surface of the cavity in the same manner. 2. Platinum matrix to fit over the gold posts. 3. Side view. 4. Porcelain fused to the matrix. 5. Completed section cemented in the cavity or amalgamated to place.

(B)

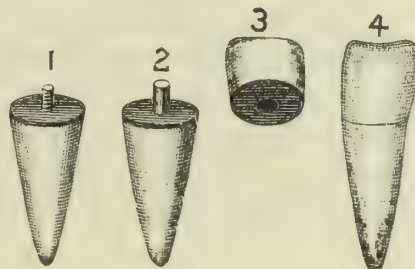


16, 17, 18, 19, 20. Modifications of the same class of work as in illustration A. See also Bicuspid (C), 1, 2, 3, 4, and Incisor (D), 1, 2, 3, 4.

(C)



(D)

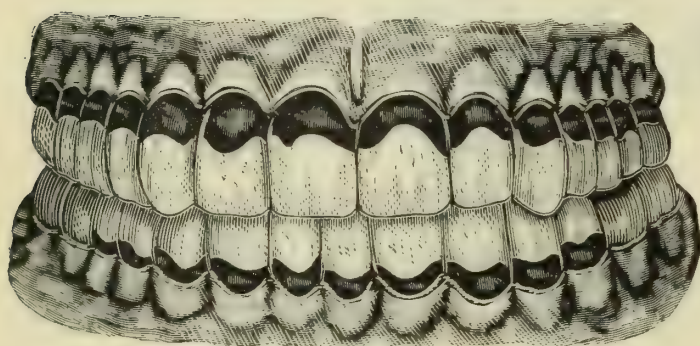


general appearance of the work free from the objection of unclean joints. It will be observed that the platinum foil extending slightly over the edge of the cavity forms a lapped joint. This simply obliterates all chances of stains collecting in a joint where the cement has been superficially washed out, and no

ever, it is merely superficial, for in eighteen years of careful observation, I have not been able to discover a single instance where the cement had completely washed out, under the most careless manipulations; that at best the disintegration was slight. In any event we can be assured that all inlays, no matter

how carelessly adjusted, are certainly a better protection than the cement alone, and I will suggest that we must not be too extravagant in our expectations, but be satisfied with the slightest advantages gained, always hoping for more as the art becomes better comprehended.

(E)



During the past eighteen years of especial practice, I find that the only way in which my patients have lost any tooth-structure has been by the receding of the gums and not by decay intervening between the sections of porcelain and the wall of the cavity in the tooth. In some instances I have had my patients return with the section or contour that had been forced out of the cavity, sometimes within a week or two, and again not for several years, but in such cases the cavity would invariably be protected by the thin coating of cement that remained intact, and in the majority of instances the section or inlay was re-cemented in place or the section reconstructed and a better retaining form provided.

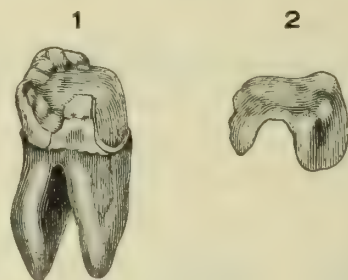
Recently I have been developing and perfecting an additional improvement, and shall introduce it as

PORCELAIN-VENEERED CEMENT FILLINGS AND FACINGS.

In the illustration F, 1 represents a lower molar, showing the cavity partially filled with cement or gutta-percha, leaving but one-fourth more to complete a perfect contour. The figure 2 is a veneer of porcelain formed from the cavity in 1 according to the usual manner of making inlays. This veneer is not more than the

fortieth part of an inch thick. On the approximal side of this thin veneer is a medium composed essentially of certain oxids combined with a suitable flux. This is painted over the surface in a similar manner to that practiced by china decorators, and then submitted to a temperature equal to the melting-point of pure gold, and when allowed to cool the result is that you have established a film or coating that is homogeneously combined with a vitreous mass. Substantially it is a coating of oxyphosphate with which the phosphoric acids in all our usual cements will chemically combine. It will be readily understood, therefore, that when a cavity in a tooth is filled with the cement and a veneer of this description has been so prepared and pressed into place, in a few minutes we have practically a porcelain-coated cement filling—in other words, a protected cement. Some of the most valuable qualities of this class of operations consist in the greater ease of cavity preparation, greater immunity from thermal changes, and, in such instances as those in which pulp-capping has been

(F)



practiced and congestion or pulp-devitalization may occur, ready accessibility may be obtained by grinding through the thin veneer of porcelain and splitting it off. And, on the other hand, where a thick mass of porcelain has been cemented in a large cavity it will be found exceedingly difficult and painful to remove the same, especially when the pulp is in the first stages of congestion.

In connection with the preparatory work I partially fill the cavity in a tooth with a form of sheet gutta-percha that is composed of about one part gutta-percha

and four parts zinc oxid. I look upon this combination as very valuable as a tooth-preserver, in view of the fact that the tooth may be filled within four-fifths of the whole space of the cavity, and from its containing such a large percentage of zinc oxid. Our common zinc

(G)



oxyphosphate cements, owing to the phosphoric acid they contain, will also adhere firmly to the gutta-percha filling. The illustration G shows the relative position of porcelain veneer, gutta-percha filling, and protected pulp.

HIGH AND LOW-FUSING BODIES.

Recently this subject has been discussed by some members of the profession, and much confusion has been developed but no satisfactory conclusions reached. In offering my assistance on the subject I will suggest that both bodies and enamels that are appropriate for dental uses have a practical fusing-point that ranges from about 1900 F. to 3400 F., and that within this compass from twelve to fourteen varieties may be of some substantial value, and that in proportion as our facilities will enable us to ascend in the temperature of fusing-point the ideals of perfection are the nearest accomplished, and in proportion with greater ratio, as we descend toward the lower-fusing mass we narrow the field of its utility. The reasons become quite obvious when we consider the wide differences in the properties that are chemically developed by the uses of the various fluxes necessary in order to raise or lower the fusing-point. Each material is distinguished by individual properties that are more or less desirable according to the purposes or uses designed.

In dentistry we seek for the qualities that demonstrate the inherent power of maintaining the most perfect form or contour both before and after fusion, and yet will show a perfect glaze. Also, porcelain bodies must retain their color after repeated reheatings, and show the least tendency to shrink. All low-fusing bodies seriously lack such properties, therefore their uses in porcelain dental art will be very much abbreviated. If the broad claims that some manufacturers and dentists are making were true—theorizing that a low-fusing vitreous mass is equal to the high-fusing, alike in strength, color, and power of contour—then we ought naturally to be amazed at the foolishness of our leading tooth-manufacturers, who have for years, as their criterion of excellence for their wares, held to the highest possible point of fusion; and we would be inclined to suggest to them that their teeth had better be made of glass.

Just a few more remarks on one other most important branch of this interesting specialty, which I shall refer to as

ENAMELED METALLIC CAPS.

Illustration H represents a case in practice that involved thirty-one teeth. After the brown color was polished off the surface, enameled metallic caps were cemented to them, and when completed they appeared as seen in illustration I.

The operation not only provided thorough protection from future decay, but also the natural color and perfect form of the original design of nature was so complete that the art was concealed. Also the pulps were held in their normal state.

It is now about ten years since the operation was completed, and not any sign of decay has intervened, nor has any discomfort whatever been experienced. The patient was a young miss of about nineteen, whose teeth were entirely denuded of their enamel. The etiology of this case might be very interesting to those who make this feature a scientific study, as the same defects were inherited from the father by both the son and the

daughter. I have in my possession a specimen of the son's teeth, consisting of one central incisor, canine, bicuspid, and molar. These were what I could procure of twenty-seven that were extracted from the young man's mouth in order to give in return a miserable substitute. All the pulps in his teeth were sound. The father had gone through the same experiences; but how different the results in the daughter's case!

(H)



(I)

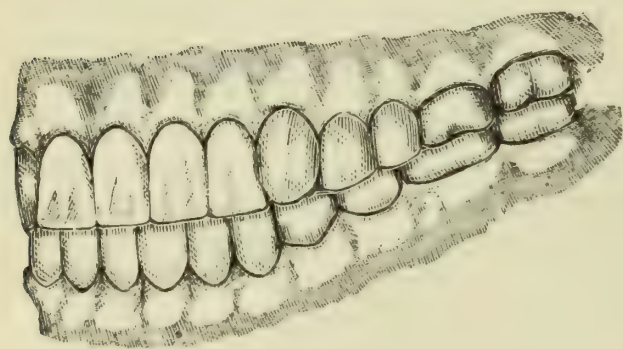


Illustration I represents the comparative difference in their appearance.

The restoration was accomplished by covering the molars, including the third molars, with gold caps, and all the remaining anterior teeth, twenty in number, were restored with enameled metallic caps.

ENAMELED CAPS OR JACKET CROWNS.

In illustration J, the figure 7 shows a thin jacket of metal (Browne & Sharpe gauge, from No. 30 to No. 33), which is composed essentially of an alloy of platinum and iridium, pure plati-

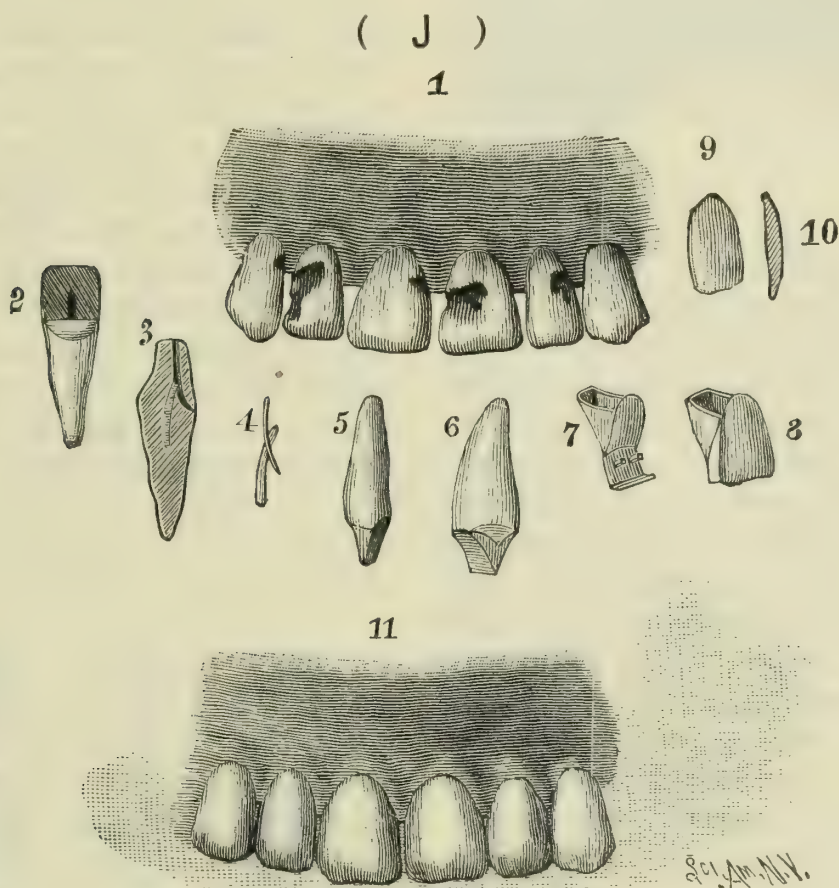
num being too pliable for durable work. The latter is also more expensive owing to the fact that in order to obtain a relative strength, the equivalent in thickness would have to be about No. 24 to No. 27 B. & S. gauge. Not only this, but it would be too thick about or between the teeth, and the results would be inferior. The illustration J, at figure 7, shows my original plan of construction. It will be observed that there are two small retaining pins established close to the incisal edge. This is intended to produce a mechanical retaining device to hold the porcelain body secure to the metal base, for we must realize that a vitreous mass, like all our porcelain bodies, does not strongly adhere to non-oxidizable metals and will readily peel off. For the past twelve years I have been dispensing with the use of the pins, having found by experience that with pockets or slight undercuts formed by tapering the end of the tooth-structure, as shown in J, 5 and 6, then fitting to such ends a matrix of soft platinum foil and passing over this the telescope cap of platinum and iridium, when the latter is conformed to simulate 7 it will differ from the former plan of construction in the fact that between the wall of the cap and the platinum matrix V-shaped pockets will be formed. Between the facing and the prepared base a porcelain body that is of a slightly lower fusing-point than that fused into the pockets is interposed. This forms the adhesive medium that when again fired unites the veneer homogeneously to the prepared porcelain and metal base, as illustrated in 8. Caps made after this plan are wonderfully strong, and will thoroughly preserve the teeth from future decay.

One of the first cases that I brought before the Michigan Dental Association in 1886 is still preserving the incisor teeth that at that time were adjusted for a girl fourteen years of age. This has now been in use seventeen years. In connection with such long periods of time the cases in which young teeth are covered, especially the class that will generally present from three to four extensive

cavities on each of the four incisors, are just the kind that the ambitious dentist desires to fill with gold, and to the sensitive patient it seems like a discouraging proposition. And it is the more so when we realize that this is the beginning of the most important period of the life of young people. They dislike to acknowledge the permanent disfigurement, knowing that a row of gold fillings would help to illuminate the defects of decay. In such cases

so favorable for their development and with the normal functions of the tooth's vitality continuing under the cap, that when the time comes for readjustment you have the great satisfaction of providing another lease of ten or twelve years on sound and healthy foundations.

Referring again to the thirty-one teeth that were capped, where all the pulps were preserved, I could add another instance where twenty-eight individual caps have been standing the test for



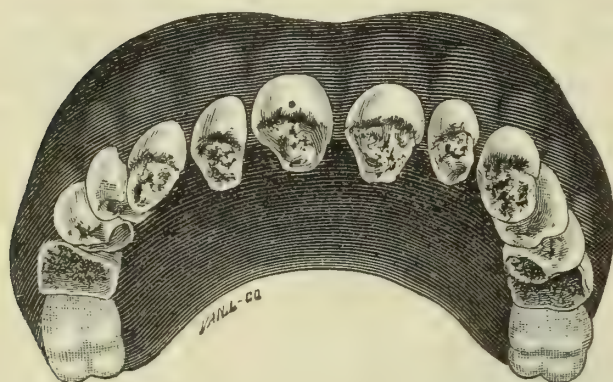
it has been my practice to cover such teeth with enamel. This is generally accomplished without the necessity of pulp-devitalization. In numerous cases where the six anterior teeth have been so treated, after a number of years I have found it necessary to readjust the cap. Some had served their purpose eight, ten, and twelve years, and the necessity for renewal was due to the continued development and extension from natural growth, which after so many years gradually exposes the joint that was originally obscured by the festoon of the gums. It is important to realize that young teeth may be so well protected, during periods

about seven years, and in smaller proportions a much larger number that have been serving their purpose fifteen years. All these, and many more, have proved that when enamel caps are properly constructed they are among the most durable and satisfactory methods of preserving and restoring defective teeth. In reality, this is a system or method of artificially clothing teeth, and is equivalent to, if not safer than nature's own enamel. I have enjoyed the extreme pleasure of examining these cases every six months to see that no decay starts beneath the caps, and after eighteen years, in these particular instances, all that my patients have

found it necessary to do was to keep their teeth properly cleaned.

I may ask, under the circumstances, providing no other provision was available, What would you do if confined to the use of older methods of tooth-crown-

(K)



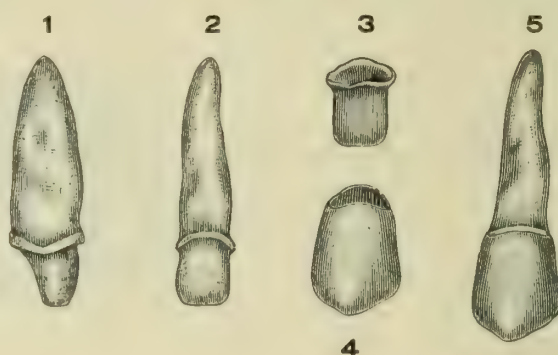
ing? Or, What other way could be suggested without the necessity of the destruction of at least fourteen pulps?

Pulp-destruction should always be the last resort. Following this principle we keep in view opportunities that favor the highest possible skill. I will offer in evidence illustration K. This represents a group of teeth showing a deficiency of enamel, the patient being a girl sixteen years of age. All these teeth were brought back to their normal appearance, proper contour, and usefulness, relying exclusively on porcelain-veneered cement fillings, contours, and entire enamel hoods. Illustration L is an example demonstrating the method of procedure. I select the canine, 1 in the illustration. The first step is to form, by means of a small carborundum disk followed by small enamel burs, a circumscribed ledge or shoulder just in line with the gum. (See the figures 1 and 2, illustration L.) This should consist of a sufficient quantity of the natural enamel left intact as a guard against any foreign body coming in contact with gum tissue, thus establishing the artificial joint where it is possible to finish it parallel to nature's outline. In this way

no overlapping shoulder is present as would be in the case of caps of metal or bands. To remove what is left of the balance of the natural enamel a series of grooves are cut across the surface at wide intervals. It then becomes comparatively easy and less painful to remove the enamel in small sections by means of a sharp chisel. (See 1 and 2, as the teeth would appear with all enamel chipped off.)

The figure 3 is the platinum foil matrix that has been fitted to 1, while 4 is the hollow veneer or shell that has been formed over the matrix. After this stage the matrix is removed. The hollow veneer then consists purely of block body as a first foundation, and an intermediate, slightly lower-fusing body, and the very thin facing or tooth form, all fused together, and when completed it represents in reality the equivalent to nature's own enamel. And when cemented over the prepared tooth, as shown in 5, it will be seen that the defective tooth has been provided with a

(L)



complete coat of artificial enamel which to all intents and purposes restores the defective parts to their normal appearance in form and color, as well as their utility; and I feel sure, from long experience gathered from the evidences of analogous applications of porcelain, that this new process is likely to prove the most efficient method of tooth-restoration and preservation that has ever been devised.

ART IN DENTAL PRACTICE.

By S. G. PERRY, D.D.S., New York, N. Y.

(Read before the New York Odontological Society, February 17, 1903.)

FROM the dawn of civilization the real and the ideal have held the same relative relationship—the ideal ever in advance, beckoning from the dim borderland where the imagination makes all things beautiful, and the real near at hand, concrete and actual as the very earth on which we tread. Never, probably, while the body and the soul are united as they are in man will this relationship be changed.

The man of affairs is concerned with the real, the man of imagination and aspiration with the ideal; but these conditions are never clear-cut and distinct. It is impossible to conceive of a man so absorbed with the real as never for a moment to long for some glimpse of the ideal; and we know that no man can live wholly in the ideal world, unmindful of the real one which supplies the conditions of his existence.

With the ideal world we associate things of beauty; with the real, things of utility. We know perfectly well what is meant by the term utility, but who knows what is meant by the term beauty?

In architecture, who can explain the joy that springs from the contemplation of the quality of proportion—that almost unattainable quality in which the Greeks excelled? In sculpture, who can define the pleasure given by graceful lines? in painting, the subtle charm of color? Who will undertake to explain in cold, feeble words the joy given by musical sounds? What can be said of the pleasure, which is almost pain, that is sometimes caused by a beautiful landscape, or a glorious sunset?

I have never found a satisfactory definition of beauty. I have studied the dictionaries and the encyclopedias, and have found long and elaborate attempts at definition, but no short, clear descriptive phrase. But this is not surprising,

for beauty is so indefinite, so elusive, that language is yet too crude to fully explain it. Perhaps the best concise definition, that I must have somewhere seen, is that it is the revelation of an unseen reality. The force of this is felt in standing before the Sistine Madonna in the old gallery at Dresden. The soul is so clearly shown in the Madonna's face that the picture seems a living presence. It is a revelation.

If there is any logic in language, and any force in this line of reasoning, then beauty is a living presence. Unreal, and yet the most real thing we know! Elusive and intangible, and yet more real and lasting than any painted picture, chiseled marble, or builded temple that the hand of man ever attempted! If the future development of the race is to be along the same line as in the past, beauty, though intangible, will be a persistent force and a perennial source of joy until the works of man are resolved back to their elements and the earth is dissipated in cosmic dust.

It is not unreasonable to consider beauty as in some way linked to the soul of man—a sort of inarticulate language through which the soul finds means of expression; an ineffable something too subtle and fine for words. Art is its pupil—its devoted, adoring, ever-faithful pupil. I firmly believe that some traces of a love of art, and through it of beauty, can be found in any human being. In a savage it may find expression in, and be satisfied with, a bead, or button, or feather; while to a modern, not even the Sistine Madonna can satisfy its inarticulate longing.

THE INSPIRATION FROM NATURE.

Since the beginning of time, artists in all departments have received their inspiration from nature. Man cannot

transcend his own experience, and he cannot get away from mother earth; the imagination, even, cannot take us into realms unlike those we have known. It might be said, then, that works of art are only works of nature idealized, and that art is great only when it is true to nature, and false when it is not. This gives us a touchstone by which to classify the art of the world; and it holds equally in the plastic arts, in painting, sculpture, and architecture. Study two elm-trees that stand near enough for their branches to touch or interlock, and the open space between will give the outlines of a Gothic arch. Study an apple-tree in the same way, and you will have a suggestion of the Roman arch. If you want a model for the Moslem minaret or the steeple of Christendom, study the slender, pointed fir of most mountain regions. I know a tract in the Adirondacks that always makes me feel that I am in the midst of holy temples, so many ever-green spires are there pointing toward heaven! And so on through the whole range of art, there will always be found a reflex of nature. The Sistine Madonna is surpassingly great because it is so nearly a breathing, living woman. It is a greater work than the Venus of Milo because it has the color of life. The sculpture is an intellectual conception, or abstraction, but the picture is a breathing presence!

I said in the beginning that beauty appeals to the soul. Art, in all its forms, appeals to the emotions, and I am not sure but the two statements express the same thing. In all religions man has endeavored to make his temples, churches, and shrines beautiful. In Europe they are repositories of art. By painting, sculpture, and music the emotions are appealed to as in no other way. The statement, "Who can resist beautiful things!" is almost an axiom. The Master was taken to a mountain top and tempted by the sight of a beautiful landscape. In "Faust," Marguerita was tempted and gave way at the sight of the beautiful jewels. Some sensitive souls grow faint from the beauty and odor of flowers.

Beauty, then, as expressed through various forms of art, is an ever-present force, and must be taken account of in every scheme of life we formulate.

The great primeval fact in existence is that man must be fed, clothed, and housed. The barbarian makes this an easy task. With the modern it is not so easy, for, whether he will or not, he must make his life beautiful by carrying art in every detail of it. His table service is a marvel of gold and silver and porcelain, his clothing an array of beautiful fabrics from all parts of the earth, and his house a dream in architecture and a veritable museum of art objects collected from all the ages. He grows unconsciously and inevitably into his inheritance, which is a love of beauty in every detail of his life.

LOVE OF THE BEAUTIFUL A NATURAL INHERITANCE.

In most old countries art has become woven into the very life of the people. Every building is constructed with a view to correct architectural effect, every gateway and fence is embellished in accordance with correct rules of art, and every landscape and garden is laid out with a view to ornamental effect. New countries absorbed in the conquest of nature, and too vigorous and active to have yet acquired the repose so necessary to the art life, may be lacking in the charm of the older countries, but in time this must be changed, for a love of art can never be strangled or crushed out. Already in this city is founded the "Municipal Art Society of New York," established for the avowed purpose of directing public taste in matters of city adornment, and what has heretofore been nobody's business is now the business of some of the most cultured and artistic men in our midst. This must be the inevitable tendency in all countries, because a love of art is born into the race and is its most sacred inheritance. Love of beauty is well-nigh universal. A friend of mine, who has had vast experience in the art world as a dealer, told me that he considered the Chinese among the most artistic people of the earth for

many centuries. He said a Chinaman of culture and refinement would hold a beautiful bowl, from which he was eating his porridge, in a manner expressing profound reverence for it as a work of art, and closing his eyes he would put it to his lips and almost swoon away from the joy of being able to eat from such a sacredly beautiful thing! A patient of mine in this city told me that a half-dozen eminent Chinamen, invited to her house, as they entered the hall fell on their knees and touched their foreheads to the floor at the unexpected sight of a pair of beautiful Chinese vases that stood near the hat-stand. It was not an affectation, but a profound reverence felt by every one at the sudden sight of these works of art. A love of beauty so profound must always be an inspiring, vivifying force. Dull and meager, indeed, must be the life of anyone who feels no thrill as he looks out on God's beautiful world, or on man's reproduction of some part of it in convincing works of art!

You may ask, What has all this to do with dental practice? Why such a long preface with no hint of its application to the subject of the paper as announced?

LOVE OF ART UNIVERSAL.

I have in mind a definite purpose in trying to show that a love of art is universal, and that it enters into the life of every one of us at every turn and during every hour of every day. Everything we touch or use made by the hand of man testifies to this universal love of beauty. All articles of utility are made as beautiful as possible. If they had no graceful lines, no ornamentation, but were hideously ugly they would not be bought or used. The manufacturers understand this, and make all their products as beautiful as possible. Even a penny toy is made as attractive as it can be, while in the domain of pure art, where the utilities are forgotten, that work which embodies most beauty is the one most sought and most liberally paid for.

The moderns must have beauty at every turn. If this be true of the things they use, the ornaments they wear, the houses they live in, and the thousand

and one things they surround themselves with, then should they not be more than exacting in all matters that pertain to personal appearance? And in what can a fastidious person be more justly careful than in the appearance and condition of the teeth. It is safe to say that the eyes and the mouth are the two most expressive features of the human face. The eyes have to be accepted about as the Great Artist made them. Man can do little to improve them after he has fitted them with proper glasses. He can take out a squint, and help them to work together, as he would teach a pair of colts to pull evenly, and if need be he can take out one and put in a glass substitute—which is always a good one to see the faults of one's friends through!

It would seem as if the eyes were the masterpieces of the Great Artist—His especial favorites to care for and shine through, His loopholes through which to look out on His world, His stained glass windows, tinted with colors mixed at His happiest moment. We sometimes look into them and see His heaven, and feel His holy presence. The teeth are given over more to our care. It is as if the Great Artist had said, "I will make something for man to tinker with. I will wait to see if, after hacking, and filing, and killing, and neglecting them, he will finally grow into an understanding of My design. Of course he will some day, for I am gradually leading him to Myself. But it may be better to let him comprehend through his own experience."

BEAUTY OF THE HUMAN DENTURE.

We are so accustomed to working upon the teeth that we do not often stop to realize what a wonderful combination they present. If the definition of beauty be extended somewhat, and made to include the adaptation of means to ends, then the natural teeth present a striking instance of beauty. The series of cusps, or domes, on the ends of the teeth, and the manner in which they interlock in a perfectly articulating set, taken in connection with the individual form of each tooth, is something that presents a

beauty all its own. In the natural world I know of nothing to excel this in beauty of design. And when the teeth are considered in relation to the general features they become of the very greatest importance.

Here then we find ourselves, as a profession, brought literally face to face to the ever-present question of art in our care of them. The physician must keep his patients well; we must go farther, and make our patients beautiful.

Each individual tooth is a study in itself. Take, for instance, the six upper incisors and canines. Imbedded in the gums, in a healthful mouth, they are models of beauty. Out of the mouth, and held against the light, every outline is a line of beauty. Not an abrupt angle anywhere, but graceful curves everywhere. If by chance any of the roots are crooked, or curved, there will be a charm in their irregularity. Nature is never abrupt, but always expresses herself in curved lines.

Consider the outlines of these six teeth as they are when imbedded in the healthful gums. Could there be more variety, or greater beauty, in their shapes and their arrangement? We are so accustomed to them that, doubtless, we do not often notice the blended effect of the broad firm centrals, the delicate laterals, and the bold, striking canines. Nor do we often stop to study the charm of the outlines of their cutting ends. The centrals and laterals, straight across, but with their corners rounded off in a manner to satisfy the keenest sense of art, and the canines with their bold cones giving contrast and character to the combined six. Then note the direction of the roots, and the firmness with which they are placed in the jaws, giving great strength and permanence. Then study the attachment of the gums. Six wavy crescents with almost as much variety in their sizes and arrangements as we found in the six teeth themselves. But this is not all. Study the tapering enamel, and note the shelter given the gum that lies over it by the thicker enamel, thereby saving it from being stripped off in the natural use of the teeth.

Every festoon of the gum beautifully tapered, and resting secure in the sulci between the teeth made by the tapering enamel! In studying the six teeth it is easy to see that nature's first consideration in their design is their usefulness; but, in addition, what graceful lines!—what faultless modeling! Not an abrupt angle anywhere, but each line melting away in accordance with the most exacting rules of art.

There is not time to consider minutely the bicuspid and molars, above and below, but there will be found the same marvelous modeling, and the same adaptation of means to ends. There will be found the same distribution of material in the manner that will give the most strength, and the same shelter given the tender festoons of the gums.

There is nothing about the teeth more beautiful than their articulation. I never study a perfect set that I do not marvel at the design, and there is nothing more striking than to note that in a perfect set the lower first molars articulate half their width ahead of the upper first molars; the lower bicuspid half their width ahead of the upper ones, and yet at the front of the mouth, since the lower incisors are so narrow they still have room inside the upper incisors. To me there is nothing more beautiful than this modest position of the lower incisors, and I have often thought the uniformity of the centrals and laterals, like an accidental in music, only accentuates, and makes more beautiful, the wonderful variety of the twelve front teeth.

Yet the front teeth are no more perfect in design than the back teeth. The difference is because of the difference of use. I wish there might be a way of dissolving out the dentin, leaving the enamel intact. What a series of marvelous shells we would have. Viewed from underneath every cusp would be a dome, the roof of which, laid with enamel bricks, would serve as a model for the greatest architect in the land. Set such an enamel shell from a molar down by the side of some colony of busy ants, and what a magnificent cathedral it would make for the little creatures,

with its Gothic arches and its resounding domes! For their recreation give them a circus tent made by the enamel from a canine, and not one of them could save his entrance fee by crawling under the edge, or by cutting his way through!

On the other hand, if you would realize the value of the enamel, dissolve it off, leaving only the dentin. I think I never fully realized the significance of the enamel until one day I saw a patient from whose teeth the enamel was almost gone from erosion. It was a funny sight, for every tooth was a caricature. They looked like a row of doddering, bald-headed old soldiers, whose occupation was gone, since they did not stand shoulder to shoulder and could therefore be of no help to each other. Having no lateral support, what could you expect from such a row of pegs? Just what you see where the file, or wheel, is passed between the natural teeth and their shapes not restored in filling.

ART PRINCIPLES IN PROFESSIONAL PRACTICE.

It is not my purpose in this short paper to enter the field of orthodontia, and endeavor to show the importance of correct position of the teeth, considered in relation to the general features. That is a subject by itself, and one of the most fascinating in the whole range of our practice. I hope, though, that what I have said on the subject of art will help to emphasize the importance of it in all its bearings. But I want to say a word in reference to the application of the broad principles of art to the selection of filling materials, the construction of fillings, and the general care of the mouth and teeth.

You may remember that for a great many years I have missed no opportunity to protest against the display of gold in our work upon the teeth. And for still many more years I have pleaded for the restoration of their shapes in filling; in season and out, this plea dates back over a quarter of a century. All these years I have met with discouragement all along the line, but I have never for a moment lost hope. I have never doubted

that in time our profession would be aroused to a fuller realization of the marvelous beauty, as well as utility, of the human teeth, and in its work upon them be filled with more of the spirit of reverence that the true artist always feels when face to face with nature, the great source of all inspiration. In the early days the great sin of our profession was the disregard of the shapes of the teeth. The separating file and the Arthur disk wrought ruin wherever the pseudo-science—not the art—of dentistry prevailed. Then came the gold crown with its vulgar bid for practice; then, as if to show to what depths of bad taste some people can fall, came the diamond flashing in the human mouth like the headlight of an engine! Fortunately this was a freak of eccentricity, and was not practiced by any respectable practitioner. Shades of the great departed in art!—what must you think of us if you are given the power to see us when we do such things!

But the hour of delivery is near at hand. The introduction of porcelain restorations is bringing about a rapid change. It is no longer necessary to use gold in the front of the mouth, and the glittering display of that inharmonious material is a thing of the past in the best practice of to-day. The demonstration of the possibility of such practice insures its adoption, for our patients after seeing it will have nothing else. Most of them are sure to have the artistic instinct, if we have not, and we are compelled to fall in and march with the procession, or be left behind.

I did not suppose that I should live to see the time when such a rapid development of the artistic side of our profession could occur. A very great many years ago, before this society, I predicted that the time would come when the display of gold in the human mouth would be considered barbarous. That time has come. If a break occurs that cannot be corrected with a porcelain inlay, the tooth can be cut off, and crowned with porcelain, and for the sake of art, I think that practice justifiable. If the work be properly done the root of a freshly devitalized tooth can never give trouble, and

surely we are able to make the crown permanent. This rapid change in practice is an object-lesson in evolution. The old way must be abandoned from the moment a better one is found. This development of the artistic in our work has come to us only after a long time, but it has been worth waiting for. But it does not bring us unalloyed joy, for in some respects it makes our tasks harder. Our first duty is to save the human teeth, artistically if we can, inartistically if we must. Here must be met a conflicting set of conditions that, to one who has an instinct for art in his work, can cause more perplexity and unhappiness than all other things in dental practice combined.

CONDITIONS WHICH COMPEL A COMPROMISE WITH THE IDEAL.

The true artist has the power of seeing his work completed before he has made a stroke. And only that completion can satisfy his soul. How absolutely depressing and benumbing, then, is the task of the dentist, who rarely finds it possible to do in the human mouth what he would like to do. He cannot linger in making a beautiful outline of his cavity, or in giving a graceful curve to his filling, with a nervous, wincing patient asking every moment if it is nearly done, and watching the clock in a manner to remind him that the charge is to be ten dollars per hour!

And what encouragement for him when, in a case in which he would be glad to make a gold filling, he is compelled, because of the nervousness of his patient, or from inability to pay, to use a plastic of some kind?

Under these trying circumstances, with the art impulse swelling in his soul, with what dismay he thinks, by way of contrast, of his fellow artist of the brush whose impassive canvas gives no sign, or of his brother of the chisel whose marble never winces and never shows a sign of life until his task is done! He must shut out from his life the gratification of his artistic instincts, and find such consolation as he can from the utility standpoint of his work. He must fix his

mind upon what can be done for the benefit of his patient, and, forgetting his own desires, endeavor to grow into a knowledge of the pleasure of renunciation. Perhaps it would be more nearly correct to say the pain of renunciation.

Imagine the despair of trying to do artistic work with the procession on the street turning in at your door, and some impatient members thereof "jawing" with the attendant because of being kept waiting so long, and others, after waiting an hour or more, going away "mad" because of not being allowed to speak to the doctor!

Consider also that auxiliary of art the modern telephone, bringing at the same moment from the four corners of the earth messages of the needs of patients who cannot wait! With an appointment-book filled six weeks in advance, the only answer that can be given is "Come in after office hours." At that late hour humanity is streaming up town, and finds it convenient to "run in and see the doctor a moment." By the time the mob has assembled, the doctor wishes he could lie down and die. Since he must live, his only course is to let art go to the devil, and then to apply himself to the task of doing the most good to his patient in the fewest number of seconds at his command! Is the task of a professional man with an overflowing practice an easy one? It is the most cruel tyranny on earth to-day!

And yet, above all this chaos, serene as the night shines the beautiful star of art; and if we old fellows who are so perplexed and unhappy cannot feel its gentle influence, throughout the length and breadth of the land there is a splendid array of young men with more time who can and who will feel it more and more—for, as I said before, the power of art is a veritable force that must be reckoned with, and our profession, beneficent almost beyond any on earth, presents a singularly fitting field for its beautiful ministrations.

SELECTION OF MATERIALS.

In the selection of materials for filling, the busy operator encounters the

same discouragements. In many cases in which in restoring the contour of a tooth he could get the best results with gold, he is debarred from the use of that material by the inability of the patient to bear the strain of the operation, or to pay for it. He must then do the best he can with materials he dislikes to use. If his patient be able and willing to pay, but is a bundle of nerves and a person for whom no one can do good work, his task is still harder because more is expected of him. Here again he must do the best he can, and he alone is competent to judge the results, for only he can know the conditions under which the work was done. For this reason I have made it the rule of my life to be very guarded in criticizing the work of other dentists. I remember one instance many years ago that taught me a lesson. A patient came to me saying she had been under the care of a man whom I knew had a worldwide reputation. The work was so poor I thought there must be some mistake, although I said nothing. After working for her for an hour I concluded that the dentist had done marvelously well. He had done far better than I was able to do, for I am not so constituted as to care to fight for my reputation.

There is a "happy medium" in all things, although in our profession, if we love to do things in an artistic way, most of our work must be done in a manner suggesting an unhappy medium.

In the selection of materials there is not much choice from the artistic standpoint, for they must be judged by their lasting qualities. I never yet strapped a patient's beard to the head-rest and put a prop in the mouth to keep it open in order to be able to do good work.

It is not easy to imagine any material more offensive to the artistic sense than amalgam. And yet who dares to exclude it entirely? I do not; I could not get square with my conscience if I should. Although such an inartistic material, it has one redeeming quality—in its plastic state it can be used as the sculptor uses his clay, and the outline of the tooth can be modeled with it in a manner to satisfy the keenest artistic sense. The advan-

tage arising from the restoration of contour in many cases is more than enough to outweigh its inherent defects as a filling material.

There is great pleasure in the use of the oxyphosphate cements because of the ease of modeling and the better color, but alas! the utility side of the question obtrudes at once, and since they do not last we cannot make great use of them.

When they are made to be more durable—as I believe they will yet be—and the manufacturers of them have sense enough to give us a far greater variety of colors, I think they will have greater value. Instead of five colors we should have twenty-five, with a little sample of the mixed cement attached to each bottle. The advantage of being able to quite accurately match the color of a tooth, and to quickly restore to shape, must always compel the use of these cements. I believe they are yet only in their infancy. When they are made to be more permanent, and of better color, it will be an unspeakable pleasure to model with them.

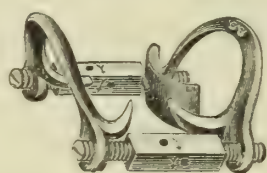
In the restoration of the shapes of the teeth in the back of the mouth, where it cannot be seen, gold in my judgment still stands supreme. It is hard to use and is inharmonious in color, but it has the quality of permanence, and it can be modeled to the outline of the tooth. I know of no greater pleasure than, with the plugger in my left hand and the lead mallet in my right, to see a filling grow into the lost shape of the tooth. Little by little the work goes on, and if there is weariness of body there is refreshment of soul as the filling takes shape, and the design of the Great Artist is worked out.

And by the way, though not strictly in the line of this paper, let me mention a matrix I have devised for restoring the proximate contours of teeth. It is a separator and matrix combined.

In the August Cosmos of 1885 I described and illustrated a matrix designed to be held in position by any one of the separators described in that issue. It was a simple piece of very thin steel, shaped to conform to the festoons of the

gums, and made of varying widths to suit cavities of different sizes. I have used that matrix almost daily from that date until recently. I have always considered it one of the best in use, but it has often been puzzling to adjust, as is generally the case with devices that consist of separate small parts. Recently it occurred to me to solder it fast to the jaws of the separator, and so make a combined separator and matrix. I did this, and the first trial convinced me that I had overcome all the objections, and now had a faultless device. (See Fig. 1.) The

FIG. 1.



marvel is that I, or someone else, had not thought of this before.

Being in a single piece it is easily adjusted or removed, and when the screws are turned it is held immovably. (Fig. 2.) This firmness is of the utmost im-

FIG. 2.



portance in any matrix. In this case there is only one thickness of steel, which can be very thin, so that a perfect restoration of contour is assured. It is easily made, as anyone can attach the matrix to an old separator with soft solder. It works well if soldered only at one end; in fact, it conforms to the contour of the work even better if so soldered.

ART IN DENTAL INSTRUMENTS.

In designing instruments for preparing cavities, as well as for filling, there is always the opportunity for the expression of the true art feeling. It is a nice matter to shape an instrument so that it shall have strength where strength is needed and delicacy of the highest order where delicacy only will avail. I am

laughed at sometimes because I have one hundred and seventy-five excavators in my working set. Most operators consider it not necessary to have so many different shapes. It is true that some of them may not be used many times in a year, but since each one is designed for a purpose, when the moment comes for its use it is better suited than a utility instrument that will answer in a dozen different places. The instruments are numbered and are out of the way on their racks when not wanted, but can be found in an instant in the dark when they are needed. I had rather give them storage, and pay the interest on their cost, than to miss their perfect adaptation to the work to be done. There is a refinement possible in instruments that it takes almost a lifetime to acquire. What an unspeakable joy to use a dainty instrument that is a work of art in its proportions and its curves! With it work is no longer work, but is the fulfillment of an inexpressible longing of the soul! I shall never forget that Dr. Corydon Palmer once said to me, "It is a great pleasure to do a nice thing in a nice way."

What I have said in reference to excavators holds equally true of pluggers. I consider that there is the same need of a wide variety of shapes and sizes in order to get the best results in the quickest and neatest way.

THE REAL AND THE IDEAL.

One of the most fascinating branches of my subject—and the one you have doubtless expected me to make most prominent—is that of the construction of artificial teeth, and the design and adjustment of various structures for the mouth. There is not time to-night to attempt so large a subject. It is worthy of an elaborate paper by itself. The contemplation of it gives great pleasure, but carries with it a minor chord of pain. The pleasure lies in dreaming of the beautiful possibilities when considered from the standpoint of art, while the pain of it comes from contemplating the hurried and commercial manner in which it is done in these days of cheap materials and cheaper methods.

Not even the best of us approach the

work in the true art spirit, or give it the time that must be given to produce anything fine in any department of effort. Some operators will not touch it because they consider they have not the time to do it all themselves, and because they cannot find anyone to do it in accordance with their ideas or up to their standards. Most of us, I presume, have the work done as best we can, and mentally mourn over it, while the patient beams with delight, and calls it beautiful! It is a repetition, though even more wearing to body and soul, of what I described in noting the deadly perplexities of an overflowing practice. I do not say that beautiful work of this class is not being done throughout the length and breadth of the land. Without a doubt there is more of it to-day than ever before, but I think the fact remains that in most offices it is done hurriedly and commercially, and with little thought of art in all its details. If the teeth are of the right size and color, and are in their proper positions and look well, and are paid for, everyone is happy, though the tongue of the patient may encounter a clumsy foreign substance and may search in vain for the clearly defined and nice-feeling teeth that Nature gave—patient Nature, who has time to work as perfectly over things that are never seen as over things that are never out of sight.

Some day we shall have artists who will consider that the inside of the arch is entitled to as careful consideration as the outside—that things unseen must be as perfect as things seen! When that happy day arrives I shall not see a patient from the hands of a foreign dentist with a formless mass of gold cemented over the upper and lower teeth so thick and heavy that if the patient were to fall overboard he would be drowned! With the same weight attached to his feet he might be saved, but with it in his mouth there would be little hope for him! The shape of the lower jaw is like a horse-shoe, and when I saw the structure cemented over the teeth I thought if I had it out I could pitch quoits with it.

After all the fine things that we may say about art and beauty in our work,

the fact remains that our first duty is to save the teeth, and our next to do it as quickly and easily as we can. I do not think we have a right, at ten dollars an hour, to fuss and fiddle in finishing a filling just to satisfy *our* sense of the artistic. Such a statement as this may seem to be a contradiction of the theme of this paper. I make it in order to show more clearly that inevitably the range of our work lies between the two conditions I set out with, the *real* and the *ideal*. It must ever be so. We work upon living, sensitive tissue, and of course all our work is done for others; if we worked upon wood or stone or canvas we could work for ourselves. A week or a year spent in painting a picture would be solely our own business. Two hours spent on a filling which could be as well done in one is equivalent to stealing ten dollars from the patient.

In conclusion, how can we logically escape from the tangled maze of contradictions that we find when we try to reconcile the real and the ideal? In the first place, we must not forget that no other specialty of the healing art bears the same relation to art in its broadest sense as our own. Medicine and surgery must keep the world well; dentistry must help to do the same, but, as before stated, it must go farther, and make it beautiful. Naturally, and very properly, dentistry from the beginning has unconsciously been called an art. It will be so considered to the end of time. If it is to be even more than at present considered a branch of medicine, it will be rated as the artistic branch of that great profession. Then we must foster and encourage the artistic in our work. We must cultivate the art instinct in ourselves, and we must try to impart it to our patients. We must resist the rapid spirit of the age, and strive for serenity of mind and body. We must do our work more patiently and more artistically, and then it will be better done. This brings us back to the utility side of the question, and points the way to the realization of that which has been the dream of the ages—the bringing together of the real and the ideal.

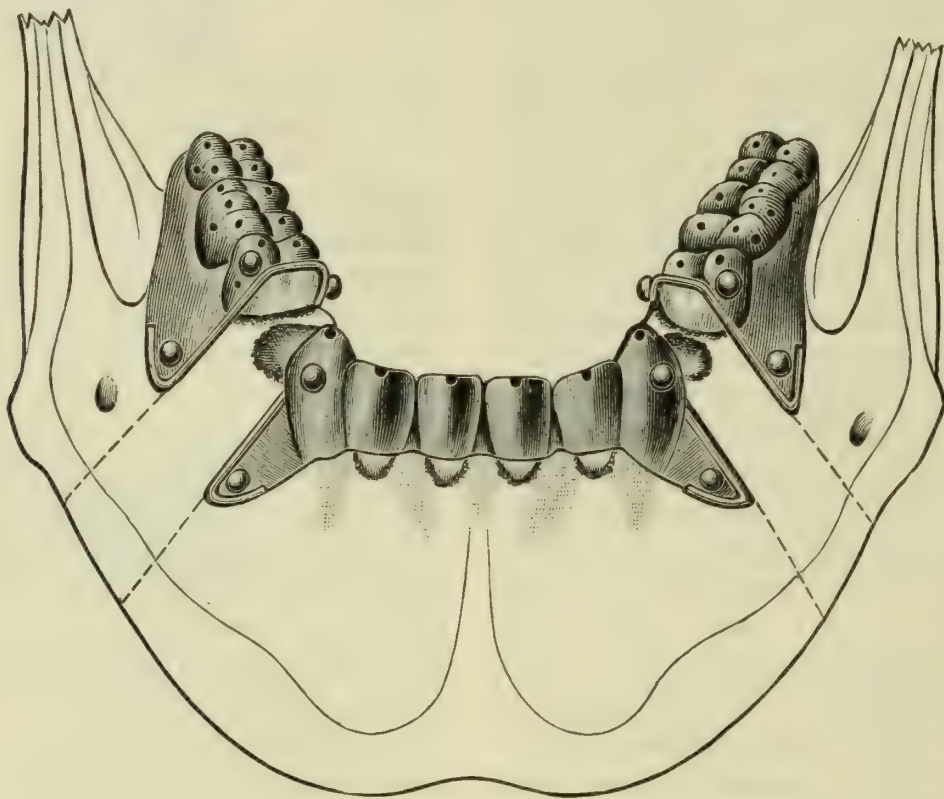
A FRIENDLY CRITICISM OF DR. ANGLE'S PROPOSED TECHNIQUE IN THE SURGICAL CORRECTION OF MANDIBULAR PROTRUSION.

By RODRIGUES OTTOLENGUI, M.D.S., New York, N. Y.

IN the DENTAL COSMOS for April 1903, pages 268-274, appears an article, by Dr. Edward Angle, wherein is discussed an operation in which I have long taken a keen interest, notwithstanding the fact that I have never as yet been able to persuade a patient to submit to

tists. I must believe, therefore, that Dr. Angle would not desire any orthodontist to follow his method only to find it resulting in failure, if not actually contributing thereto. And I am sure that he will not object to a friendly criticism—the object of which is wholly to point

FIG. 1.



this means of correcting that dreadful deformity, extreme protrusion of the mandible.

In the course of his paper Dr. Angle alludes to the case reported by Dr. Blair, and, declaring that the occlusion after operation was not satisfactory, proceeds to outline a mode of procedure whereby he would anticipate a better result. I have no doubt that in advancing the proposed technique Dr. Angle aims to aid surgeons of the future who might undertake this operation in collaboration with dentists, or, better still, with orthodon-

out those dangers which experience leads me to believe will be met by any surgeon or orthodontist following the advice given.

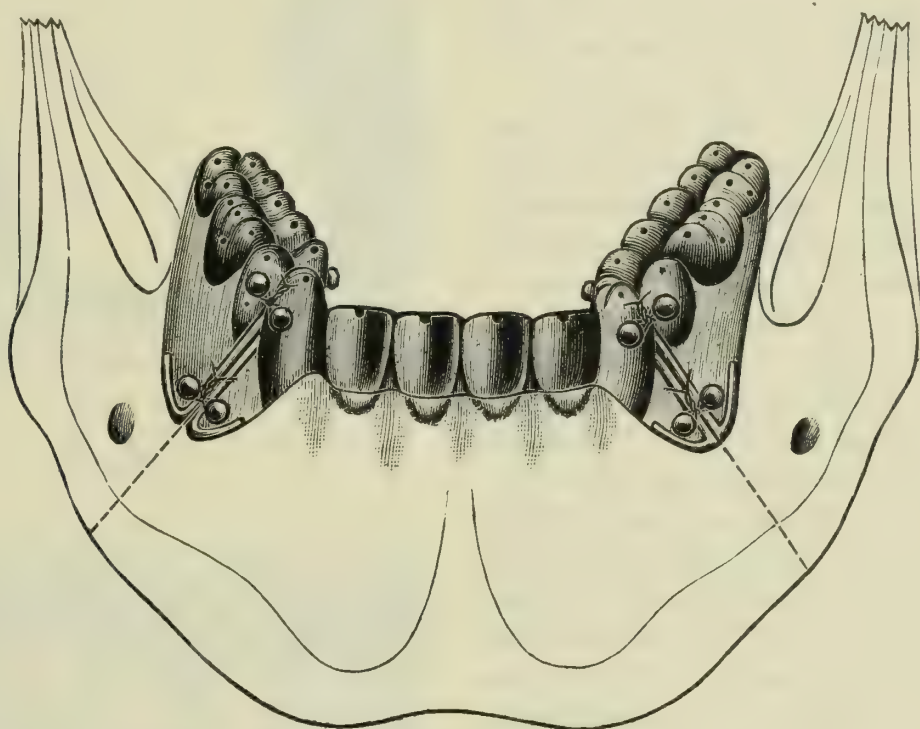
In brief, Dr. Angle's plan is to make accurate models of the jaws of the patient, and to remove from each side a section large enough to permit the rearrangement of the fragments in such a manner as to reduce the protrusion and correct the occlusion. On the reconstructed model of the mandible his idea is to make a splint in three parts, shown in Fig. 1 ("Fig. 10," Cosmos, page 273)

prior to operation, and again in Fig. 2 ("Fig. 11," *Cosmos*, page 273) after the operation. These three parts of the splint are to be cemented to place prior to operating. "Then," he says, "at any convenient time the section can be removed from the mandible, the end of the plates offering excellent guides for the blade of the saw. After this is done the segments of bone are brought into correct apposition and firmly held by wire ligatures wrapped about metal buttons, as in Fig. 11" [Fig. 2].

ginal localities or nearly so, being held by the soft tissues attached to and surrounding the bone. In pressing the frontal segment back, the intervening soft tissue, which of course cannot be removed to any extent, must necessarily be compressed, and the force needed to bring about coaptation would depend upon the amount of tissue and the resistance offered. This would always be considerable, and in certain cases quite extreme.

It appears to me that at this stage

FIG. 2.



Now, I take the liberty of indicating what seem to me the fallacies in this procedure. As a mechanical scheme conducted upon plaster casts there is absolutely no obstacle in the way of a perfect result. But it must be remembered that totally different conditions will obtain when dealing with the living subject. First, the plaster cast represents, in a sense, nothing but the bony structure of the mandible, and upon a segment of the cast being removed from each side nothing intervenes, and of course the frontal segment may readily be placed in apposition with the lateral, the jaw being thus easily reconstructed. Repeating the operation on the patient, however, after removal of the bony segments, the remaining segments would be in their ori-

of the operation the sectional splint would be disadvantageous—first, because of the difficulty of reducing the frontal segment, and secondly because the means of holding the three parts united seem inadequate, the binding wire being difficult to draw absolutely tight, and, even if made so, having less resistance than would be obtained in a continuous splint.

But the main trouble will arise after the operation. It is conceivable, though improbable, that the surgeon might make the sections and reduce the parts to coaptation successfully, and that the orthodontist might unite the parts of the splint with binding wire so that the segments would be held in place. But Dr. Angle has recognized that his sectional

splint, bound together with wire, would not be as strong as a continuous splint, and he has therefore for good mechanical reasons extended the edges of the splint along the contemplated lines of the sections, so that additional buttons can be placed, thus affording added opportunity for binding with the wire ligature. But surgically this feature would make serious difficulty, and in many cases, if not in all, would render the removal of the splint obligatory. The reason is that if any part of an interdental splint impinge upon the soft parts along the line of the wound, irritation will ensue resulting in swelling, in increased irritation, and, if the splint be left in place, in necrosis of the soft tissues.

In *Items of Interest* for 1897, pages 1 to 11, will be found a report of a case in which I had the honor to be associated with the well-known and skillful surgeon Dr. Geo. Ryerson Fowler. This was a case of intentional section of the mandible, the object in this instance being to obtain space through which to operate upon a sarcomatous growth. Prior to the operation I constructed a vulcanite splint, which fitted accurately and which was highly polished and smooth at all edges. On pages 7 and 8 of this report appears the following: "Two days later I was called by telephone to visit the patient, as she was suffering considerably from the splint. Upon examination I discovered that in the region of the wound all the soft parts had become so much swollen that the splint, which at first did not touch the gum tissue at any point, was now in contact with it and had already caused a most painful abrasion."

And a little farther on occurs this passage: "After all such surgical interference it is well to remember that swellings may occur immediately in the region of the fracture, and special caution should be taken to avoid impingement of the splint in this vicinity."

In this case the rubber splint was abandoned, and one of gold was made that was so constructed as to hold the jaws in occlusion, as is seen in Figs. 3 and 4. The report from which I have

quoted was published in 1897, but the operation had occurred on September 25, 1894. In the interim I had made several similar metal splints for fractured jaws, and this warning was not alone based on the experience in the first case, but upon an observation common with all, viz, that great caution is necessary to restrict the contact of metal splints to the teeth; swellings, inflammations and ulcerations

FIG. 3.

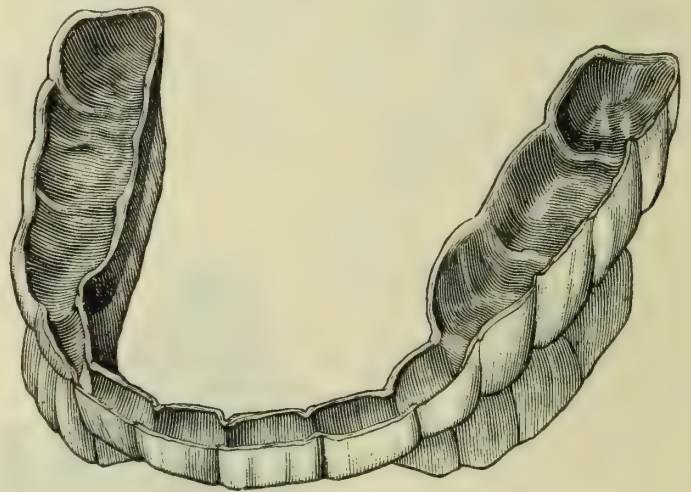
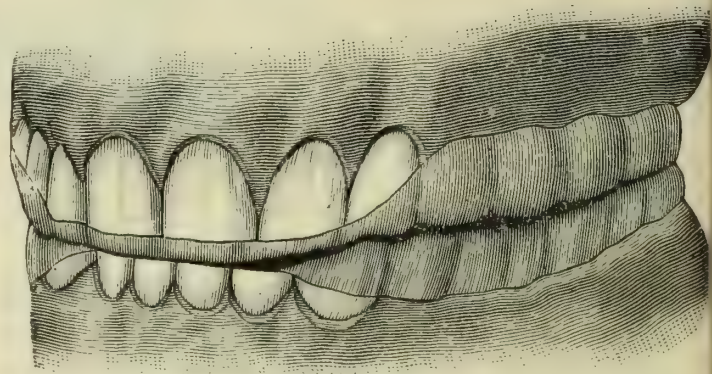


FIG. 4.



being almost the invariable sequence where the soft tissues are overlapped or touched.

For these reasons I cannot but believe that the splint shown in the last two figures would better serve in the contemplated operation than the sectional splint advocated by Dr. Angle. Moreover, I believe that this double splint is better than a splint fixed to one jaw only, and I have had experience with both. Theoretically the splint cemented to place is very attractive, but in many cases the teeth offer poor opportunity for success in such a venture, notably when teeth are

missing from the arch; again, even when apparently well cemented to place the splint will sometimes come off, usually at a time when the dental attendant is not at hand.

In the contemplated operation of double resection, where the reduction of the protrusion and the correction of the occlusion are of paramount importance, it seems to me that the double continuous splint would be especially advantageous. The mandible is to be divided; it is the movable jaw: what better method of fixation can there be than to bind the segments of the movable jaw against the immovable one, holding them in such apposition as to insure the occlusion? Such a splint is stronger than one in sections, and moreover the reduction of the frontal segment is more easily accomplished, the splint serving as a guide, while the bandages force the segment into position. That this is not speculation is proved by the following cases from practice:

Shortly after the first use of this double splint, Dr. Fowler called me to his assistance in connection with a fractured jaw which had been neglected for some weeks prior to admission in the hospital. I do not remember positively whether the fracture was single or double, but I do recall that on one side necrosis had set in, rendering it necessary to remove a loose bicuspid and the bone about it. From models I constructed a splint intended to hold the fracture and at the same time obtain the best possible occlusion under the circumstances. Because of the extent of the necrosis, Dr. Fowler removed perhaps a little more bone than I had provided for with my models; but, however that may have been, it seemed so difficult to force the jaws into the splint that one of the assistants proposed wiring the parts. This was not done, but after much manipulation by Dr. Fowler the jaws were engaged within the splint, though not pressed fully into it. Tight bandages were placed, and within twenty-four hours the parts were fully within the splint, and not only did union occur, but the subsequent occlusion was exactly

similar to the models on which the splint had been made.

In another instance, a physician brought me a man who had been dismissed from a hospital as cured. All external lacerations had healed but the fractures had not united, as was attested by a fistulous tract in the bicuspid region on each side. The man had a double fracture, and at the hospital they had removed a first bicuspid on one side and a second bicuspid on the other. I incised the wounds within the mouth freely and then used bone-burs until satisfied that all necrotic tissues had been removed. The rearrangement of the parts was conducted on rather a novel plan. I found the segments easily moved and brought into occlusion with the upper teeth. I therefore attached ligatures to the molars on one side and passed them across and over the tongue and around the molars on the opposite side. Closing his mouth these lateral segments were placed in good occlusion and the ligatures tied tight. The frontal segment was then pushed to place and ligatured on both sides. This of course was all temporary, and only served to hold the parts in place during the taking of an impression. Models were made and occluded, and the double metal splint constructed. This was worn in connection with occipital bandages and the bones united with a good occlusion of the teeth.

I mentioned that I had never been able to find a patient who would submit to the operation. It was immediately after the brilliant success made by Dr. Fowler in cutting and restoring the mandible in the case quoted, that is to say in the winter of 1894, that a patient came to me with a protrusion of the lower jaw. I proposed surgical interference, and hoped with Dr. Fowler's aid to carry the case to successful termination, but the patient finally declined. Others have done the same since. It seems hardly probable therefore that very many operations of this character will be attempted, though I have recently heard that a London surgeon has reported several cases.

REMINISCENCES.

By Dr. JOHN T. METCALF, New York City.

(Read before the New Haven Dental Association, January 13, 1903.)

THERE will be little of interest, and still less of instruction, to the members of this association, some of whom shared in the fifty or sixty years of struggle, of triumph or defeat, which form the subject of these reminiscences. But I trust you will pardon some seeming egotism in my effort to describe the conditions and difficulties which hampered the dental aspirant of those early days.

It was in the year 1839 that my thoughts turned toward dentistry. The prosperous career of Dr. Charles C. Allen (a relative) induced me to study for the dental profession, and I entered his laboratory in Park Place, New York city, curious and bewildered, but determined to master all of the art and mystery lying before me: The difference between lead and zinc; how to mix that indispensable substance, plaster of Paris; how to soften wax, the only material used for taking impressions; how to swage gold plate, to line up and adjust artificial teeth; how to solder and finish the cases—all of which things were made familiar in a few weeks! No impression compound, no plaster impressions, were dreamed of; no rubber for vulcanization; even correct articulation was largely a matter of chance or speculation.

The mastery of these rudimental and fundamental processes was at that time held to be the chief if not the only gate to a successful practice; and a successful practice was determined then, much as it is now, by the income of the practitioner in hard cash. Nevertheless, the art of filling teeth with soft gold was not neglected, and my preceptor was remarkably skillful in that direction.

It was in that year, 1839, that "amalgam" came into use—violently opposed by some and strongly indorsed by others.

The only method of making it was by filing a silver piece (preferably an English shilling) and mixing the dust with quicksilver in the palm of the hand. Strange to say, this crude material has in practice outlasted some of the more pretentious and elaborate modern compounds warranted not to swell, shrink, or change color. I had been in practice about a year (early in 1841) when a traveling salesman came into my office and offered to sell this simple formula, as a great secret, for five dollars. Everything in those days was held as a secret, and sold for a price.

One of my reminiscences was my first extraction of a tooth without the help of the "turnkey," an instrument held as indispensable in a dental equipment of the time. A huge molar in the mouth of a stalwart sailor was the object of my ambitious slaughter, and though the effort was successful it required so much strength and nerve that hardly enough remained to enable me to pocket the fifty cents which my grateful patient cheerfully disbursed, and which I carried a long time in my pocket in memory of that event.

So also those early gold plugs, the result of infinite labor and proud self-congratulation, which sometimes came back in the patient's hand, after having rattled around in the cavity until they yielded to the seductive power of molasses candy. But only a few of these painful and expensive lessons were required. It may be as well to mention the fact that long afterward, in 1867, it was my fortune to demonstrate in London, Eng., before a select company of leading dentists, the American methods of "building." The case was an upper bicuspid, and included the entire crown.

Those of you who have had the benefit

of thorough training in modern college methods can hardly appreciate the difficulties with which the pioneers of the art and science of oral surgery had to contend. Hard digging with crude instruments;—imperfect hand burs, which wanted to make more impression on the gum than on the enamel, and sometimes formed an unwelcome blister on the palm of the hand of the user. No swift-running engine to relieve the aching back; no rubber dam; no antiseptic but carbolic acid; everything crude, all methods empiric, and almost without a basis of true science.

I need not recall the advent of sulfuric ether, for which I paid fifty dollars—for the right to use the patent "compound," so called, but which returned abundant income from the popular frenzy for taking the "sleeping" novelty and giving up the precious dental organs to have them replaced by artificial substitutes; and chloroform, soon to follow, which gave promptness and intensity when mixed with ether.

It was about this period, without strict sequence as to time, that "hard rubber" was born—in the conception of which New Haven bore a conspicuous part, as Drs. Mallett and Wheat being justly the pioneers in this art, Goodyear having invented and introduced the fundamental process. Some of the early specimens of dental plates made from this beneficent substance were of such ambitious thickness and ponderosity as might cause a megatherium to blush and hide his diminished head. But the undaunted Yankee spirit was awake; hundreds of busy and inventive hands and brains were at work, and step by step the useful and high-smelling vulcanite advanced toward perfection.

I shall not weary you by discussing the relative merits of gold and rubber as bases for artificial dentistry. This subject you have considered and decided long ago. This, and the values of gold and amalgam for stopping, have left the stormy sea of futile debate and come into the calm waters of crucial experiment, where questions of durability, expediency, and the like have settled them-

selves in the mind of every man and are no longer questions for discussion.

Previous to the year 1858 "oxychlorid of zinc" had not been heard of in our profession. In that year I had the honor, after consulting with Professor Silliman of Yale College as to a proper name, of baptizing that lean and hungry infant, and also his younger half-brother "oxy-phosphate," whose "insoluble, non-irritant" ghost still lingers to torment ambitious explorers in his hopeless territory. Somewhere in the future—perhaps near, probably distant—a discoverer may be born to bring forth the "insoluble, semi-transparent cement," so long and so eagerly sought, which will be hailed as the greatest boon to humanity. May it come in the twenty-first century—unless, possibly, it should later transpire that, in the march of science, teeth shall no longer decay! Let no one hasten to dispose of his instruments on this hypothesis; the time is not yet. Wait until the obituary of adhesive gold appears in the *COSMOS*!

Touching the first introduction of oxychlorid of zinc for filling teeth, I may mention that I published the complete formula for the preparation and use of this article in the *DENTAL COSMOS* in 1861 (vol. iii, page 6). This, so far as I know, was the first practical formula published, and was immediately followed by a host of preparations, all claiming to be the original Jacobs.

The instructive history and development of the dental engine, from the crude ancestral "horse-clipper" to the present electric-driven, smooth-running piece of delicate machinery, is not without interest. Neither is the advent and development of the vulcanizer, to which the ruin and dilapidation of each step of progress, now in your scrap-box, bears silent mournful witness. But why linger among these odoriferous and familiar reminiscences? You all know them too well!

As I look back through the long avenue of fifty or sixty years' practice, the way appears strewn with broken and discarded efforts, each one the parent of another and better one, and this, again, of

another advance. But why recall these ancient tales, if not to show that progress is the order in dentistry, as in absolutely all things, and that it is on a march toward perfection.

Dentistry is mainly *reparatory*. We build up that which is broken down; we make well that which was sick. What, then, will be the condition in those days surely to come when teeth shall be neither sick nor broken? True enough some of you will say, we occasionally see a spoke of the wheel of progress, as it passes by, but what boots it to us what transpires a hundred years hence? Let us make our teeth for eight dollars a set or ten dollars a tooth, as we find occasion; we are willing to ride on the wheel of progress as long as it goes our way, but we have neither time nor inclination to hasten matters, which we think are well enough as they are.

What should perhaps have been mentioned earlier in its proper place is the fact that with the advent of Dr. W. H. Atkinson began the *renaissance* of American dentistry. I think it was in the year 1845 that Dr. Arthur of Philadelphia first published his method of using "annealed" gold, in connection with serrated points, thus making "building" possible and popular, and brought Dr. Atkinson, through his demonstrations, to the forefront of dental agitation, at that time near the boiling-point. Some if not all of you have basked in the lurid, if not always lucid, rays of his coruscating grandiloquence—fed by the fires of his intense earnestness, his love of truth, and his worthy ambition for leadership. He was the grandmother, so to speak, of a large family of mallets, some of which still survive their venerable parent. Instantaneous wedging—for which may he receive full absolution!—is also laid to his charge, together with sundry other blood-curdling devices now laid on the shelf. Nevertheless he was a bold champion of progress, a fearless lover of righteousness, and he was my very dear friend. His useful, not to say brilliant ideas

(elucidated, it must be confessed, more by precept than by actual demonstration) will live in your practice long after their source has been forgotten. Therefore it is not for us to depreciate the services of our brilliant Atkinson, either by cheap or vulgar sneers or by ignoring his just claims to original discovery.

Another little reminiscence, which may be quite *apropos* here, involves the subject of prices for dental work on the Pacific coast over fifty years ago. When failing health sent me to California, in the golden days of '49, twenty-five dollars was, in that state, the recognized price for extracting a tooth; while to fill one with amalgam cost but ten; illustrating the proverb that "Necessity is the mother of *extortion*." (I hope that your coal bins, by the way, are at present all full!)

And now, gentlemen, after sixty-four years of experience and observation along dental lines, perhaps you will pardon the natural tendency of an octogenarian to moralize. Advice is always a cheap commodity, yet I feel that you of the younger set will pardon me, and agree with me, when I emphasize the necessity of looking well to the esthetic side of practice. Be neat at all times, almost to fastidiousness, as well in dress as in speech and in office paraphernalia. On the prophylactic side let me say, Be careful about antisepsis; and at the chair be thorough and generous, looking always to the interest of the patient before the ultimate dollar,—a well-established habit in this direction being on the side of love and mercy, and insuring a sound conscience, sound sleep, and a healthy, well-earned appetite for the good and true things of life. Toward your brother dentists be cordial, and free to share your discoveries and favors, avoiding unseemly boasting; and lastly, set your faces like flint against evil-speaking and throttle scandal as you would throttle a crawling viper.

I thank you all heartily for your generous patience and kindly attention.

THE "A B C" OF CROWN AND BRIDGE WORK.*

By FRED. A. PEESO, D.D.S., Philadelphia, Pa.

(Continued from page 369.)

IMPRESSIONS AND MODELS.

THE condition of the teeth and mouth being satisfactory, the next step is to prepare the abutments for the reception of the crowns or bridges. This part of the work having already been described in a previous article (see *Cosmos* for January 1903, page 13), we will proceed with the taking of the impression, the running of the model, and its preparation.

In any but the simplest cases, those in which a glance is sufficient to tell the operator what should be done, a plaster cast of the mouth should be made and all the conditions be carefully considered before coming to a decision as to just what should be done in a given case. For this purpose a squash bite may be taken in modeling composition or wax, enough of the compound being used to take in all of the teeth. It should be carried far back over the molars and the patient instructed to close the mouth tightly, bringing the back teeth together, and the composition should be pressed well against the labial or buccal sides of the teeth and gums with the finger. The impression can then be chilled with cold water from a syringe, or small doilies or napkins saturated with ice-water can be placed next to the composition. After the impression has become hardened it can be removed and a model made from it sufficiently accurate to enable the operator to determine what is best to be done in the case under consideration. For a model of this character, ordinarily a plaster articulation will answer, but if it be a very complicated case the model should be mounted on an anatomical articulator, so that it can be studied from every point of view, especially in rela-

tion to the articulation, with the different movements of the jaw. In making a plaster articulation, the lower half is run first and the plaster allowed to extend back from the impression for a couple of inches, and while it is yet soft a No. 2 separating plate is pressed into it and allowed to remain for a few minutes, or until the plaster has hardened; then it is removed and the grooved surface is covered with a separating medium, and the upper half of the model is run.

Impressions for practical work should in nearly every instance be taken in a very fine grade of impression plaster. Modeling composition or wax should never be used for taking an impression for a working model except in a few special cases, some of which will be pointed out later. If there be dovetailed spaces or undercuts to be secured, there is no wax or modeling composition made that will give an accurate impression, but, it makes no difference what the condition or position of the teeth may be, a model made from a carefully taken plaster impression will give an exact reproduction which can be obtained in no other way.

The bite should also be taken in plaster. The advantage of taking a squash impression and bite at the same time in plaster is the absolute accuracy of the relation of the upper and the lower which is thus secured.

Where the articulation is taken in this way, it is possible to make and articulate a bridge or crown so perfectly that when it comes from the model it is finished, and will not have to be touched, to correct the articulation, when it is placed in the mouth.

When a tray is used in taking the impression and the bite is taken in wax, in

nine cases out of ten the piece will have to be articulated a second time after it has been placed in the mouth. It then has to be removed and sent back to the laboratory, necessitating a second finishing and polishing of the piece, or if it be finished in the mouth it can never be done so well. The cusps and fissures which are necessary to render the function of mastication perfect are partly or wholly obliterated, and the usefulness and beauty of the piece is spoiled, or at least impaired. The wax bite is liable to draw somewhat in removing it from the mouth, and in nearly every case requires to be trimmed in different places before it can be pressed to position on the model. It is almost certain to give a little more in one spot than it does in another, so that the relation of the upper and lower will not be exactly the same as it was in the mouth. When the plaster is used, there is no giving or springing to the bite, and the relations must of necessity be an exact reproduction of them as they appear in the mouth.

It is an excellent plan to color the impression plaster slightly, as it is of assistance to the operator in separating, the difference in color enabling him to instantly distinguish between the impression and the model. Whenever a fresh supply of impression plaster is obtained, a little powdered carmine stirred into it will give a pink or flesh tint to it when it is mixed for taking the impression.

Another thing which will be appreciated by the patient is to flavor the plaster. A few drops of cologne in the water, before stirring in the plaster, will impart an agreeable odor and flavor to it which will render the taking of the impression a much more agreeable operation for the patient to undergo. It will frequently happen, too, that it will tend to relieve or altogether prevent the nausea which many patients experience when having an impression taken where only the plain plaster is used. Little things like this make a favorable impression on the patient in the operator's favor and are often the opening wedges by which he enters from a medium into a lucrative

practice. Nothing should be neglected which will add to the comfort or pleasure of the patient.

In any of the posterior teeth, or where a full gold crown is to be used, if enough of the tooth be standing so that an accurate impression can be obtained and the tooth be properly trimmed, the band can be better made and fitted on the model than it can be in the mouth. An impression of the abutments can be taken in the ordinary way with a tray, and after the model has been prepared the bands can be made and fitted and then placed in the mouth and the impression and bite taken. With a good model and some experience, but the one impression and bite is necessary. The whole of the work from the beginning to the end can be made on the model, so that on the second visit of the patient the work is ready for the mouth. It is always best to do as little of the work as possible in the mouth, for, regardless of how skillful the operator may be, or how familiar with the work, the constant cutting, fitting, and trying of the band on the tooth does not always create a favorable impression, while it certainly does cause the patient a great deal of unnecessary suffering. After an impression has been taken, patients will often look at it and say, "Well, I don't know what you can possibly make out of that," but if after a few days they return and find that a beautifully finished and perfectly articulated bridge has been constructed on the not understood "that," it seems something like magic to them, and the dentist immediately rises several hundred per cent. in their estimation. There is nothing which will win the confidence of the patient so quickly and surely as a well-made and perfectly adjusted piece of bridge work. A nice gold filling may be admired, but a bridge from a few broken-down teeth or roots, restoring the whole or a part of a lost denture, inspires confidence as no other operation in the mouth does or can do.

TAKING THE BITE.

The success of a piece of bridge work depends largely upon its having a perfect

articulation, and great care should be exercised in securing a correct bite. Before introducing the plaster, the patient should be instructed to open and close the mouth, repeating the operation several times, and the teeth which are not to be included in the impression should be examined, so that the operator may know just what the correct closure is.

As every dentist knows, it is sometimes next to impossible to get the patient to close the mouth properly. The lower jaw is apt to protrude, or be thrown to one side or the other as soon as the plaster is put in the mouth. If while the mouth be open the tip of the tongue be placed far back on the center of the soft palate and be kept there while the mouth is being closed, it will be impossible for the patient to give the wrong bite, for, if the lower jaw is protruded or thrust sidewise, the tip of the tongue must move with it. After the patient has been instructed, the impression can be taken. In any but very large cases a little salt or potassium sulfate should be used to hasten the setting of the plaster, but in very large cases little or none should be used, as the plaster is likely to set before it can be properly distributed.

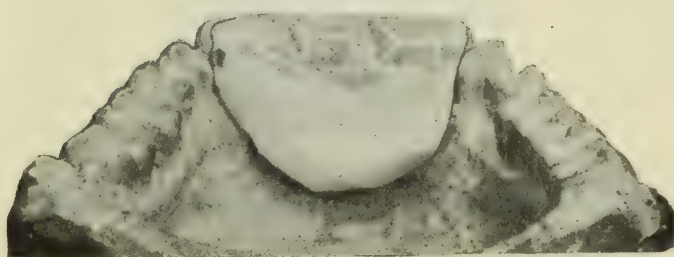
The plaster should be thoroughly mixed, and when it is just so stiff that it will not fall off the spatula when it is turned edgewise or upside down, it is ready for the mouth. The teeth which are to be used should be well covered, taking in a few of the adjoining teeth and the plaster built up thickly in the intervening space between the abutments. The occlusal surfaces of the opposing teeth in the opposite jaw should also be covered, and the patient be allowed to close the mouth, bringing the back teeth tightly together, and cautioned not to move the jaws until the plaster is well set. The teeth which are not included in the impression should be carefully examined to see that the patient has given the correct occlusion. With a wet spatula the plaster can be smoothed and pressed around the teeth and gums on the labial or buccal side. The impression should be left in until it has become well hardened. When the plaster re-

maining in the bowl breaks with a clean, sharp fracture and no moisture can be squeezed from it between the fingers the impression can be removed from the mouth. It will generally come away in a more or less broken condition, but if it be thoroughly hardened, the broken parts can be easily reunited and fastened together with a hard, sticky wax, and after drying for a few minutes can be varnished and the model run.

SECTIONAL IMPRESSIONS.

Where the teeth are very loose, or there are exaggerated dovetailed spaces, the impression can best be taken in sections. A good method of doing this will now be described. We will take for example a case where the lower incisors are very loose and an accurate model must be secured on which to make an appliance to hold the teeth in position. The plaster should be mixed to the consistence already mentioned, using plenty of salt or potassium sulfate. If necessary, the teeth can be held in place, from the labial side, with the finger. The plaster is then placed on the lingual side of the teeth and allowed to harden. (Fig. 42.)

FIG. 42.



It is then trimmed even with the incisal edges of the teeth and notched or grooved, as shown in Fig. 42, after which it is given a coating of sandarac varnish or some other separating medium. The labial side of the teeth is then covered with plaster, letting it extend over the edge of the teeth and also over the grooved portion of the top and inner side of the lingual impression. (Fig. 43.) After this has hardened it is removed from the labial side first and then from the lingual, and the halves will set together precisely as they were in the mouth, giving an exact impression of the

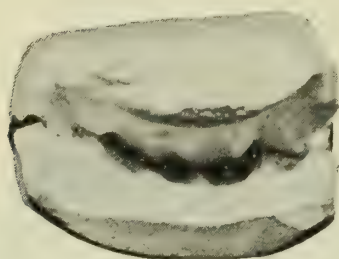
parts. (Fig. 44.) In this way it is possible to get an accurate impression without any possible danger of removing the loosened teeth and without causing the

FIG. 43.



least pain or inconvenience to the patient. The halves can then be waxed together and varnished, and when the cast is made it gives a more perfect working model than can be obtained in any other way.

FIG. 44.



For a separating medium, sandarac varnish will give as good results as anything else that can be used, for when the model is run it will have a smooth, polished surface. It should first be colored; this can be easily done by scraping a little of the crayon of an indelible or a copying pencil into it, which will impart a purplish tint to the varnish. Only a very little of the crayon is necessary, that of a single pencil would color many gallons of the varnish. The impression should be slightly moist for varnishing, for if it be perfectly dry the sandarac will soak into it and will not give a glazed surface, but if it be too wet the varnish will not stick to the impression, but will scale off. If it be dry it should

be dipped in water and then laid on a piece of blotting paper or cloth for a few minutes, to take up the excess of moisture before painting.

It will make the separation of the model easier if the impression be dusted with talcum powder, which should be blown out with a chip-blower before running. Soap or oil should never be used as a separating medium if it be desired to have a hard model, which is always necessary for crown or bridge work, as they have a tendency to make the model soft.

THE MODEL.

In running a model it should always be articulated so that the opening and closing movements will be in the same direction as in the mouth; that is, if the bridge be on the side of the mouth the articulation should be made so as to extend back from the molars; while if it be in the front of the mouth, the articulation should be directly back of the central incisors and on a line with the center of the palate.

In extensive cases it is best to use an anatomical articulator, but in the making of most small bridges and for single crowns a plaster articulator may be used.

In making a model from a squash bite, the lower half should always be run first. The reason for doing this is that by having a regular system of running his models the operator always knows just how to go about separating them. When the sides of the model are trimmed, the grooves in the articulation will at once enable him to distinguish the upper from the lower half, and he will know just how to cut without danger of injuring the cast, but if the part be run first which happens to be turned up he can never be certain as to which is the upper or the lower, and consequently will have to use greater care and spend more time in separating. The models should not be any larger than necessary, and should be well trimmed and finished. In running the model it is better to have a glass slab rather than a paper to put it on, as the glass leaves a better surface and makes a neater model. The old adage that "A

good workman can do a good piece of work with poor tools or appliances" may be true, but it is certain that he can do a much better piece of work with good instruments and good models.

Working models should always be made of the hardest plaster obtainable. Plaster which gets very hard is always coarse; it can generally be distinguished by rubbing it between the thumb and finger. It is, too, always slow in setting, and nothing should be used to make it set quickly, for the more quickly it hardens the softer will the model be. It should be mixed with cold water and stirred only enough to thoroughly incorporate the water, as much stirring has the same effect as the using of salt or warm water, making it set quickly; consequently it does not get as hard as it otherwise would. The plaster should be mixed to about the same consistence as for taking impressions.

The half of the impression which is to be run first should be filled with water; then most of it is shaken out, leaving a little in the bottom of the impression. A very small quantity of plaster is placed on the edge and worked down into it with a jolting or jarring motion and a little added at a time until the impression is filled. In this way a perfect model can be secured, but if a large quantity of plaster be put in at first, the result will probably be an imperfect cast with plenty of air-bubbles in it. A small camel's-hair brush may be used to work the plaster in, but this does it no better than the method described.

After the impression has been filled, the balance of the plaster mixed is scraped from the bowl on to the slab and the filled impression set into it, the plaster extending an inch or more beyond the distal side or end of the impression, and a No. 1 separating plate is pressed into it, the ridged side of the plate down. This is allowed to remain for a few minutes until the plaster has set, when it can be removed. Before removing the plate, however, and while it is still a little soft, the plaster can be trimmed from around the impression and plate with a spatula. The plate be-

ing removed, the articulation is given a coating of sandarac, and after allowing it to dry for a few minutes the upper half is run in the same way as the lower; covering the grooved articulation and pouring the surplus plaster on the slab; the upper half is pressed into it, and after allowing it to harden a little, the edges or sides are trimmed away. When it has set, the model can be removed from the slab and the surplus plaster cut away. If it stick to the glass, apply a little heat to the under side to loosen it.

In the absence of the separating plates, the plaster can be smoothed with the spatula, and, when it has become hard, grooves or notches can be cut into it with a knife, after which it is varnished as described.

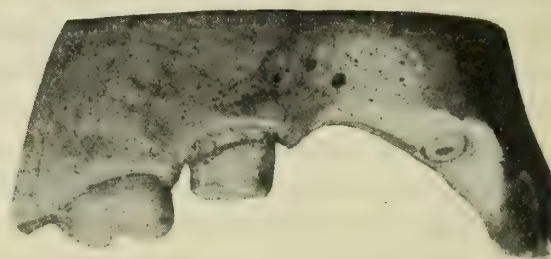
In separating, the impression is readily distinguished from the model by the difference in color. The colored plaster is carefully cut away from the sides until the purplish tint from the varnish shows that the model is near, and the teeth should be uncovered as far as possible. When the impression is nearly all cut away a knife is introduced between the articulation, and by a little careful prying the halves are separated, after which the remaining impression plaster is easily removed. The models can then be trimmed and smoothed, and if rubbed with talcum powder it will give them a beautiful polished surface.

The first step in the preparation of a model, in getting it ready to work on, is to dry it out thoroughly. This should be done with a slow, gentle heat. If dried too quickly and with great heat the model becomes baked, and so soft as to be worthless, the plaster crumbling easily between the fingers. It is a good plan to dry them over night by placing them over a radiator, in front of the register, on a shelf at some distance above the kitchen range, or in any place where the heat is not too great, so that by morning the moisture is entirely driven off. It can readily be told when the model is entirely dried out by holding a mouth-mirror against it. If it be dry the mirror will remain perfectly clear, but if there be the least bit of

dampness about it the mirror will become clouded, and it should be left longer to dry. The model is then trimmed, cutting down on a line with the sides of the teeth to nearly one-sixteenth of an inch below and parallel with the gum line. A hoe-shaped excavator with corners rounded so that it will not deface the tooth is a good instrument for doing this. The plaster can then be cut away from the edge of the groove, so as to facilitate the festooning and fitting of the band by enabling the operator to see when the edges are fully down to the model. (Fig. 45.) After it has been properly trimmed, it is soaked with sandarac varnish, either by immersing it or by giving it several coats one after another as the varnish soaks into the model, until it has taken up all that it will and

begins to glaze. It is then thoroughly dried again by gentle heat, when it will be found to be very hard, and it will withstand the wear of fitting the bands

FIG. 45.



or crowns with very little abrasion of the model. For this purpose the sandarac as purchased at the dental depots, diluted one-half with alcohol, is of about the right fluidity to render the model hardest.

(To be continued.)

PROCEEDINGS OF SOCIETIES.

INTERNATIONAL DENTAL FEDERATION: MEETING HELD IN STOCKHOLM, SWEDEN, AUGUST 1902.

(Concluded from page 380.)

Commission of Hygiene and Public Dental Services.

MONDAY, AUGUST 18, 1902.

THE opening session of the Commission of Hygiene and Public Dental Services was held in the Caroline Institute, Stockholm, Monday, August 18, 1902, with Professor Dr. Godon in the chair.

The following members were present: Drs. Queudot, Zsigmondy, Wachsmann, Lizka, Hesse, Davenport, Younger, Gordon White, Hayes, Viau, Martinier, Frick, B. Holly Smith, Godon, Guerini, Benson, Harding, Whittaker, Bain, Guldberg, Weber, Bensow, Smith-Housken, Barrett, Bödecker, Weiser, Förberg, Heidé, Frank, Jenkins, Cunningham, Röse, Sauvez, Aguilar, and Harlan.

The Commission then proceeded to the election of officers, the result of which follows: N. S. Jenkins, Dresden, president; Dr. C. Röse, Dresden, Dr. J.

Frank, Vienna, Dr. E. Förberg, Stockholm, Dr. G. Cunningham, Cambridge, vice-presidents; Dr. R. Heidé, Paris, secretary.

Dr. J. FRANK presented the report of the Commission of Hygiene, which was not read because of its length.

Appended to this report was a communication (marked "A") of the Austrian Secretary of the Interior to the local authorities instructing them to study the question of the relation of dentistry to public hygiene; one marked "B," comprising the sixteen questions that were addressed to the members of the Commission in different countries; one marked "C," being the report of Dr. Frank to the Austrian Secretary of the Interior, comprising besides the principal document several smaller ones; a

report by Dr. E. C. Kirk, Philadelphia, on public dental hygiene in the United States, comprising the text of the law providing for dental services in the army, and an extract from the DENTAL COSMOS on the proposed law to provide for dental services in the navy; also several papers embodying the answers to the questions sent out by the special committee composed of Drs. Elof Förberg, George Cunningham, and Johan Frank. These answers refer to the condition of public dental hygiene in England, Denmark, Norway, Russia, and Switzerland.

The conclusions of the report are as follows:

1. Popular dental hygiene is as yet in a state of detrimental neglect in the majority of civilized states, though here and there are found evidences of an initial improvement.

2. The Executive Council will address through the national federations a memoir upon dental services to the different governments, inviting them to submit the propositions therein contained to competent examination.

Dr. Frank then read the circular which the committee proposed be sent to the governments of the various countries. The circular here follows:

The Executive Council of the International Dental Federation, at its session held in Stockholm, August 15-20, 1902, has discussed and approved the report of the Commission of Hygiene, and following the suggestion therein embodied has agreed to request the co-operation of the governments of the different states toward that branch of public hygiene which deals with the care of the mouth and teeth.

The Executive Council has learned with regret that this very important branch of general hygiene has been conspicuously neglected in practically all countries, and that the pupils of the primary and secondary schools, representing about twenty per cent. of the entire population, do not receive any dental care whatsoever.

The Executive Council of the International Dental Federation, comprising the delegates of all the dental associations of different states, being concerned in elevating the scientific status of dentistry and in introducing it into the realm of public hygiene, respectfully begs to draw your attention to the accompanying reports, which we earnestly request may be submitted to the consideration of the eminent personages having charge of your systems of education and public hygiene.

These reports show that dental caries is a public evil which is daily increasing in magnitude, and that in certain countries from sixty to ninety per cent. of all the inhabitants of twenty years of age are sufferers from dental caries. Furthermore, these reports show that this widely propagated malady can become the cause of general organic disturbances, that it makes of the mouth a culture medium for the development of zymotic germs which if permitted to develop produce diseases acute and chronic (even tuberculosis), and that a certain number of persons thus affected are rendered physically incapable of entering the ranks of certain callings.

The Executive Council takes the liberty of calling your attention to the urgent need of eradicating this evil for the sake of human welfare, and considers that the best means of combating it consists in the organization of public dental services.

As regards dental services in schools we will refer you to appended reports "D," "E."

The gratuitous dental services for the poor could be arranged as follows:

(a) By the appointment of public dentists.

(b) By the organization of dental clinics in the public hospitals.

(c) By giving free dental attention to the poor in the dental schools under governmental control.

(d) By the appointment of dentists in all charitable institutions.

With reference to the establishment of dental services in the army and navy, we beg to call your attention to Chapter III of the report.

As to the organization of dental services for employees of inferior grades, we offer the suggestion that a savings fund be organized among the men for this particular purpose, and that dentists be attached to manufacturing establishments in which the teeth of the employees are exposed to noxious influences (phosphorus, mercury, acids), in order to carry out bi-monthly examinations of the teeth and to give proper conservative treatment. Such dentists should be under the supervision of the district physician and of the inspector of factories. It would be likewise advisable to organize dental services among railroad employees.

Finally, it is of urgent necessity that councilors having a dental education or a certain degree of familiarity with dental matters should be appointed to the different boards of health. To these members could be entrusted the study of dental problems as well as the promulgation of measures concerning the organization of dental services.

EXECUTIVE COUNCIL *F. D. I.*

Mr. A. R. BAIN, Melbourne, spoke on the ideal arrangement of placing dental hygiene under state control. Every dentist should work toward the attainment

of this reform, as dentists alone can appreciate its vast importance. The secret of healthy teeth everybody will admit depends mainly on the care and attention given to them in early life. It becomes at once evident that in early life the teeth should be inspected at frequent intervals, and the best way of accomplishing it would be by placing dental inspection under the care of the state. We must not lose sight of the fact that public authorities must be careful of the hygiene of the people in view of maintaining the health of the nation, and therefore, with the same purpose in view of elevating and improving the race, the teeth should not be neglected. The question is not only of an individual character, but also of national import.

Mr. Bain suggested that to the communication proposed by Dr. Frank be appended a notice to be posted in all public schools, setting forth in simple terms the imperative necessity of brushing the teeth after meals, the reason for doing it, the advantages of this practice, the dates of eruption of the permanent teeth, the advantages to be derived from dental inspection, and the list of free dental dispensaries for the treatment of those who for financial reasons could not afford to have their teeth attended to in private offices.

Dr. C. RÖSE thought that while Dr. Frank's report was well framed it was not sufficiently clear, and made a motion to the effect that its adoption should be deferred to the next meeting of the Commission in Madrid.

Dr. FRANK thereupon stated that it had taken him a year to collect the data necessary for the preparation of the report, and that it would mean a loss of time to defer its discussion to the Madrid meeting.

Dr. GODON suggested that the conclusions alone be discussed at that session.

Upon motion by Dr. SAUVEZ, the Executive Council decided to undertake the study and final adoption of the report and the forwarding of it to the different governments.

The Commission then extended a vote of thanks to the members responsible for

the preparation of the report, Drs. Frank, Cunningham, and Förberg.

Dr. JENKINS thought that the president of the Commission should be familiar with the French language, and as his own knowledge of that language is very imperfect respectfully submitted his resignation in favor of someone better suited for the office.

The members of the Commission, however, insisted upon having him as their chairman and rejected his resignation by acclamation.

The meeting then adjourned.

AUGUST 19, 1902.

The meeting was called to order at the Grand Hotel by the president, Dr. N. S. Jenkins, Dresden.

Dr. RÖSE made a motion to the effect that a committee be appointed to correct the report as presented by Dr. Frank.

Dr. HEIDÉ stated that inasmuch as the report had been in the hands of the members for several days they ought to be in position to present their remarks at once.

Drs. FRANK and RÖSE called attention to a few inaccuracies in the report.

Dr. JENKINS moved that the original report of the Commission be revised, translated, and addressed to each member of the Council to be approved and signed before October 31, 1902.

The memorial presented by Dr. Frank on the previous day was then adopted.

Dr. RÖSE made a proposition with reference to the organization of conferences on public dental hygiene, saying that a good method of developing this important branch of general hygiene would consist in illustrating these lectures by means of appropriate slides, as carried out at the present time in Dresden.

Dr. FÖRBERG said that, at Stockholm, illustrated lectures on dental hygiene have already been given by himself.

Dr. HEIDÉ stated that also in France illustrated lectures have been given upon this topic.

After a few remarks by Dr. GEORGE CUNNINGHAM,

The Commission adjourned to meet in Madrid in April 1903.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, February 1903.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, February 17, 1903, at the Academy of Medicine, No. 17 West Forty-third street, New York city, with the president, Dr. Hodson, in the chair.

Some routine business having been transacted,

Dr. S. G. PERRY, of New York city, read a paper entitled "Art in Dental Practice." (Printed at page 445 of the present issue of the COSMOS.)

Discussion.

Dr. R. M. SANGER. I want to say just a word on Dr. Perry's paper. It is not only of art, but it is artistic. Anything which appeals to the higher, broader, nobler nature of mankind is commendable. The standard cannot be set too high. The pity of it is that often it is set far too low, and when papers of this kind are presented to a scientific body their only influence can be to bring that body up to a higher plane. And so I want to thank Dr. Perry to-night that he has given the time to prepare and has considered us worthy of hearing such a paper as this. To go into the details of it would seem like wasting time, because to take it apart would only mean for us to discuss the cold, hard, unpoetic side—the side that touches us all—its utility. Bryant has said that

Truth crushed to earth shall rise again;
The eternal years of God are hers!
But Error, wounded, writhes in pain
And dies among his worshippers.

And so it is. We see in the practice of our profession abortions which make us blush to think any of our *confrères* would stoop to such a thing; yet we may live in hopes of the higher ideal—that Truth will sooner or later conquer; and it is such papers as this that will lead us to a realization of such hopes.

Dr. J. I. HART. The president pref-

aced the opening of this discussion by saying that a paper of this character was well-nigh undiscussable, and I think we are all tempted to agree with him. When the ideal is presented to us in the form that it has been presented to-night, all we can do is to say "Amen," and envy Dr. Perry for his eminently able manner of presenting the subject to us. We surely have had a literary jewel given to us to-night. Dr. Perry announced that he had been asked at short notice to fill a breach; he has filled it nobly.

The paper is a literary jewel, in that it has so many facets—ideal facets, practical facets—and I think Dr. Perry enunciated ably the thought that even with the best ideals our limitation is found, after all, in the ability of our patients to stand certain work. There are those who will encourage us in our failures with porcelain, so that we do not feel as discouraged as we otherwise might be, and there are others who even though we indicate to them its limitations and possibilities, do not assist us in overcoming certain physical difficulties which we are bound to encounter. I feel as anxious as any member present to make use of porcelain in my practice as largely as I can, and yet there are some patients for whom I do not feel justified in making the attempt, because I know they will not bear with me in the failures. There are others for whom I am willing to undertake cases in which I know the chances are against success, because I know they are consistent in their part of the effort.

Mr. President, I am drifting toward the practical side of the paper, and I think it is not to our advantage to be led away from the artistic side. I feel uplifted in having attended this meeting to-night and having listened to the very able paper of Dr. Perry.

Dr. J. H. HANNING. What struck me most about this paper was the delicate way in which Dr. Perry brings home the things we all experience in our practice,—how at times we are discouraged, and how we struggle on; and though he did not say it, he expressed the thought of the ingratitude of patients, of those who expect so much, although the material with which we work is so fickle and our ability so insufficient sometimes. Although he did not say anything about the wounded feeling and the sentiment crushed at times, I felt that he was describing exactly my sensations with certain patients. So many are ungrateful and never give the dentist credit for his efforts, considering him just as a man in any commercial business, acting in a manner implying that one must understand that he is being well paid for what he does, and they expect him to do it just so.

Yet, in spite of the wounded feelings, we struggle for this ideal. I think this is one of the grandest papers I have ever listened to. It is an inspiration, and I shall remember it as long as I live.

Dr. PERRY. The paper was very hurriedly written. It could have been made twice as long and yet all would not have been said. I had some hesitation in coming before this society with a paper prepared so hastily on a subject that it seems to me means so much. It is a repetition of the story that confronts us every day—the struggle of two opposing forces, the desire to do something better, and the necessity of doing something worse. I suppose it comes home to every one of us.

There is one point that might have been mentioned, as Dr. Hanning says—the ingratitude of patients. We have all felt that, and it is a very curious thing that where we have been most self-sacrificing sometimes, and tried hardest, we have been least appreciated; and on the other hand, where we have not tried very hard we have been rewarded with the milk of human kindness. Some day, if I live long enough, I hope to treat this subject in a more fitting manner.

The PRESIDENT. Gentlemen, we will

now hear from Dr. John I. Hart, who has promised us something of practical interest.

Dr. HART. I also was asked by the chairman of the Executive Committee to help fill the breach. The breach has been filled, and I have no excuse for occupying your time, but as this is a very short paper I shall perhaps not be encroaching too much.

Dr. JOHN I. HART, New York city, then read his paper, as follows:

ROOT-CANAL FILLING.

In the February issue of the *International Dental Journal* appears an article by Dr. Arthur R. Dray of Philadelphia, read before the Academy of Stomatology of that city, in which he says: "The many methods of pulp-canal filling have been so frequently and ably demonstrated by so many eminent men that to-day pulp-canal filling is considered a matter of fact and a more or less easy operation; but at the same time the truth remains that the trials are many when a successful root-canal filling is the goal sought for. Notwithstanding the many methods for canal preparation and filling and the records of success, the past knows of many unrecorded as well as many recorded disastrous failures. In the hands of the very best, many an obdurate tooth has refused to respond favorably; many a patient has been lost; many a restless night caused and many a regret on both sides expressed."

The properties that should be possessed by a canal filling are as follows:

- (1) It should be capable of completely filling the canal and sealing the apex.
- (2) It should possess antiseptic properties.
- (3) It should be capable of easy insertion.
- (4) It should be durable.
- (5) It should be pliable and moldable.
- (6) It should neither expand nor contract.
- (7) It should not discolor the teeth.
- (8) It should be impermeable to fluids.

(9) It should be easily removable from the canal.

As you are well aware, we have many root-canal fillings, all of which possess some of the requisites mentioned. In my estimation none of those which are recognized as standard root-canal fillings comply with all these requirements. The one most extensively employed is the zinc oxychlorid, but it falls short of the last-mentioned requirement. Theoretically speaking, it is not a difficult matter to remove from a root-canal a zinc oxychlorid filling, but in nearly all instances when it is necessary to remove such a filling, it is because of pericemental irritation which renders the tooth particularly sore to the touch, and the last third of the filling is exceedingly difficult to remove and a source of irritation to patient and operator.

In my practice, gutta-percha in root-canals is only of use in sealing the apex of a root which has been enlarged and is to receive a dowel or a post to support a crown; having enlarged the canal, I know when I place the gutta-percha that it is carried to the point which I desire; and in the event of the post loosening, the crown can be reset without fear that infection of the apical space may have occurred; or, in roots which possess unusually large apical openings, I feel safer in filling with gutta-percha, but in a normal root I know of no canal filling which comes closer to our demands than iodoform compound and a tin point.

Knowing the prejudice that exists against iodoform on account of its disagreeable odor, I will pass around for your observation the iodoform compound, in which, owing to the essential oils, the odor is not only decreased, but I think you will not find it perceptible. For those who deem iodoform too inert for this purpose, aristol or hydronaphthol might be substituted. Tin points, which I here show you, are made so that they can be inserted in the finest canal, or in larger canals.

Lead points of a similar shape are furnished, but in my hands are not so satisfactory as the tin, being a trifle less stiff than are the tinpoints. The earliest root-

canal fillings were made with gold foil and shredded tin foil, as indicated by Dr. Henry H. Burchard in his article on the treatment and filling of root-canals in the "American Text-book of Operative Dentistry," as well as gold, copper, and lead points, and wood points dipped in creasote.

In that article I find no mention of tin points, and in conversation with my professional friends I have found that they are not extensively used; in fact, when I desired to get my last supply from the dental depot I was informed that they had given up their manufacture. At my solicitation they accepted an order for a quantity to be made up as a special order.

In Dr. Burchard's article he suggests that "The readily oxidizable metals have not found favor, owing to the possibility of dentinal staining following their employment." I have not found, however, that the tin points, used as I shall suggest, present this difficulty. When the canal is ready for filling I measure its length and cut off a section of tin point from some part of the point corresponding to the circumference of the canal, cutting the point somewhat longer than the canal, so that when it is inserted it can be turned over into the pulp-chamber. Then I take a small quantity of the iodoform compound on a smooth broach and pump it into the canal to about half its capacity, taking care that it is carried to the apical end; if any excess be spread on the pulp-chamber wall it is readily removed with spunk. The tin point is passed quickly through a flame, for the purpose not of heating but of sterilizing it, and is then placed in the root-canal, turning over the excess of tin. An oxyphosphate of zinc is placed over the root-canal or canals, and our tooth is ready for its filling.

If there is never any subsequent trouble, we have a canal filling which in my estimation answers all the requirements and which for several years it has been almost my exclusive practice to use. If unfortunately it becomes necessary to open such a tooth for treatment, any time after we reach the pulp-chamber we

can withdraw the tin point and we have a canal ready for treatment without subjecting our patients to the annoyance of the tedious removal of another filling material.

Discussion.

Dr. HATCH. I would like to know just what this iodoform compound is of which Dr. Hart speaks.

Dr. HART. Iodoform, zinc oxid, and oil of cloves.

Dr. HATCH. Do you make it yourself?

Dr. HART. No, it is prepared under the name of Foulkes, in Philadelphia, by Dr. Foulkes.

Dr. HATCH. Did I also understand that Dr. Hart does not recommend the use of those points when the apical foramen is large?

Dr. HART. Yes, that is what I said.

Dr. HANNING. Has the doctor used the Söderberg mixture? It is composed of zinc oxid, powdered alum, thymol, and enough glycerin to make a stiff paste.

Dr. HART. I find the paste gets crumbly, but probably that may be from improper mixing.

Dr. HANNING. Yes; it evaporates quickly, and if your office is very warm the paste becomes soft. In cold weather it is somewhat hard, but that can be obviated by adding a little glycerin. It can be rolled into a cone and readily applied. I have found it quite hard and not readily removed with a broach—not that I was over-curious about it, but I attempted to remove it to insert a post.

Dr. M. L. RHEIN. I do not think the profession has found as yet the ideal root-filling. My own opinion is that, of all the fillings we have at present, chloro-percha followed up with gutta-percha comes nearer to what we are aiming at than anything the profession has at its disposal. Very little attention has been given to the sterilizing of gutta-percha and chloro-percha before using, and I have failed to hear any detail given to that point; but it is a very easy thing to sterilize gutta-percha with formaldehyd before using it, to overcome any possible infection that may have clung to the

material. Personally, I think there ought to be no occasion for the removal of a root-filling.

Of course, this brings us back to the ideal condition spoken of in a general way by Dr. Perry in his beautiful paper—a condition of affairs that never should necessitate the removal of a root-filling; and I do not believe that a practitioner who endeavors to reach, as far as possible, that point should seriously entertain the question of the removal of that filling, as far as any of the trouble related by Dr. Hart is concerned.

There is a possibility in crown work of the necessity of going up into a root, but there we are met with the staple of the crown, not the root-filling. It brings up a different condition of affairs. I simply cite that point as bearing upon the paper that preceded it. It eliminates in my own mind one of the conditions that the essayist laid down as a necessary qualification for root-filling.

Dr. HATCH. Dr. Hanning, speaking of the Söderberg mixture and Dr. Hart's mixture, makes me think we should give a word of caution to the younger men who read this discussion, about placing too much dependence upon the antiseptic properties of permanent root-fillings. I take it that there is no antiseptic which will be permanently effective, and the nearer we approach to filling the root in a mechanically perfect way the better off we are. The principal reason why I would use an antiseptic would be the reason Dr. Rhein spoke of—the prevention of any infection then and there. Antiseptics do not stay permanently in teeth, no matter what we put in.

Dr. M. L. RHEIN. I agree so thoroughly with the remarks just made that I want to correct a possible error in what I said. If I said chloro-percha, in regard to formaldehyd, I did not mean that; I referred more to the gutta-percha points. It has been my custom for some time to have those lying in a solution of formaldehyd, and immediately after removing them from that solution to put them into the canal, in order to obviate any possible infection that might cling to the point. Dr. Hatch has struck

the keynote of root-sterilization. I would like to echo the strongest affirmative response to that. Our only means of avoiding infection through instrumentation, in the preparation of the root-canal, or by chemical means, is by having a root so free from organic matter that infection from anything remaining in the canal becomes an impossibility. If that be accomplished and every precaution be taken, root-canal trouble becomes almost an impossibility when the canals are sealed.

Dr. GEORGE EVANS. There is this about the subject of root-fillings that I do not understand: how a whole profession seems so blind on certain points regarding the infection of root-canals. It seems as simple to me as anything can be, and I have followed it out for years. I have practiced this method for some time and can set the time exactly. I moved from Thirty-fourth street to Thirty-ninth street ten years ago next month; and in that time not one single tooth from which I removed the pulp has come back abscessed. It is done on a principle as simple as A B C, and I cannot see why it has not been understood. I promised the Institute of Stomatology a paper on that subject three years ago, and I never gave it because I did not get time to write it. I made that statement before some of the members, and they asked me to bring it before the society.

Members get up and state that they fill root-canals with cotton, gutta-percha, wood, and other things, and they have varied success. What does root-canal filling depend on? Does it depend on closure of the apical foramen? There is where they all break down: they talk about the apical foramen. How many teeth become infected through the apical foramen? Not one in a thousand. I have a case now that I am watching. The patient fell on the ice a short time ago, and the central was pushed far in. I put her in the chair and with my fingers forced it up. Tears came to her eyes but it brought the tooth up into position. It would have been a serious thing if the alveolar process had not united, and I

watched it; it has united and grown fast. The last time she came in, about a week ago, to my annoyance I found the pulp had died and the tooth was slightly discolored. I am going to leave it there and see if it abscesses. So far it has not.

The whole secret is not in closing the apical foramen, as dwelt upon so carefully by Dr. Hart; it is in the closure of the canal! How does the pulp-canal become infected? Ninety-nine times out of a hundred, from the oral cavity. Fill a root-canal with anything you wish in an extracted tooth; put it on the shelf, leave it there for a time, open it, and there is no odor there; but if the tooth were in the mouth it would be different.

I was conversing with Dr. Perry some time ago, and either he or the gentleman associated with him said that he practically fills the end of a root-canal, closing the foramen with gutta-percha and filling up the rest of the canal with oxychlorid. He probably has great success with it. Why? Because oxychlorid is an antiseptic filling in itself. It is one of the densest cements we have, and it closes and hermetically fills up that orifice. Here is the whole secret: hermetically seal up the orifice of your cavity; keep out infection from the oral cavity through the secretions of the mouth. I do not care even if your filling is loose, if you have the orifice and root-canal hermetically sealed, no infection will take place; but if you fill it with gutta-percha, for instance, no matter how much you sterilize it, filling your root-canals entirely and then placing in an amalgam filling, the patient ten chances to one will come back with trouble there. Why? Because all amalgam shrinks, and so the cavity becomes infected around that amalgam. It gradually works up around the gutta-percha, which is never an air-tight filling, and works up around the canal, and infection takes place.

All my success in that line depends on this: The removal of the contents of the pulp-canal is necessary; then the filling of that so that the orifice is hermetically sealed. Some time ago a patient of a most respected friend of ours

in New Jersey, a splendid operator, came into my hands, and for some reason I had to remove a gold filling. It was a splendid filling, adhesive gold, packed tight to every part of that cavity and up the root-canal to a slight extent; and to my astonishment, after getting out the filling, I found the whole root-canal filled with a wad of cotton. I carefully removed it, passed it under my nose, and there was not a particle of odor. How did it stay there all that time? The apical foramen was open, because he had treated an abscess there. How did that occur? He was a splendid operator and he had put in an air-tight, water-tight filling and it had preserved the cotton intact all those years. There was another self-evident proof that I am right. I will not speak about diseased teeth that come into my hands; but where the root-canals have been prepared by me from the beginning, that has been my record, and I did it entirely upon this principle, as I have told you. Infection does not take place from the apex, but from the oral cavity. The orifice of the canal should be hermetically sealed and zinc oxychlorid is the thing to do it with, filling a little of the cavity with it under your filling. That is the whole secret.

Dr. RHEIN. I have enjoyed listening to Dr. Evans' earnest remarks. I do not question in the least the results he has accomplished, and I trust he will pardon my simply disagreeing with him as to why he gets those results. My impression is, he gets the results for the very reason he spoke of before—because his work in cleansing out the root-canal is absolutely thorough and he has left none of the organic matter in the canaliculi of the root. I must differ with him as to the remark that it is impossible for root-canals to become infected except through the entrance into the canal. I do not doubt that such infection can take place, but I really believe those are the exceptions. It is very true that the infection does not all come from what he terms the apical foramen. There are very few roots that have any foramina inside the roots; the infection can come from those which are almost microscopic in charac-

ter, and it can come from the peridental membrane; but the point I wish to emphasize is that such infection cannot proceed in a canal that has been thoroughly cleansed of organic matter. That is the reason of Dr. Evans' success, and it is the reason of the success of all of us when we do thorough work. I simply want to draw his attention to this little pathologic point, on which I take the liberty of disagreeing with him, in stating that there are a great many entrances by which infection in root-canals can be effected, and that the most common is through some circulatory form beyond the gingival margin. I take issue on that point.

Dr. EVANS. I said that for ten years I had followed that method, and for the first few of those ten years I did not use sulfuric acid as I use it now, and I did not go to the apex of my canals in many cases, especially some of the canals in molars; in many of them I left them right there, using a saturated solution of aristol in oil of cloves. As to filling tubuli, I never filled any in my life; but I have played the mischief with them with the essential oils and aristol, and, in the beginning, iodoform; but what is the use of having your place filled with the odor of iodoform when you have in aristol all the properties you desire? What is the great essential in iodoform, coming down to the science and pathology of it? It is the nascent iodine that is liberated that comes in contact with organic matter. Iodoform enters into combination with hydrogen sulfid and forms iodic compounds that are liberated. With aristol you get nascent iodine liberated as rapidly in the tooth-canal as you want it. Put it in solution with oil of cloves, on one of your probes. Leave it there for a while. You will find iron iodid has already to a certain extent been formed there and you can get it without using iodoform in the manner described. I used to use it, but I have not needed it for years. The perfect sterilization and mummification, with essential oils, of any remnants of organic matter left in root-canals should be done first; then fill the root-canal as well as you can, and

hermetically fill the roots. How a canal gets infected in that way, I do not know; I do not take stock in infection through the pericementum. I cannot say I have seen a tooth affected in that way, with all due respect to Dr. Rhein.

Dr. HANNING. I would not like to go on record as advocating the use of this Söderberg mixture simply on account of its antiseptic qualities. The manufacturers of it said it would mummify the pulp. I get my broaches up as far as I can, and then put in a good tight filling; I do not know whether my success is due to that or not. The very first time I used it I made a failure. The tooth was already affected. A druggist who was in my chair said, "Suppose you try it on my tooth." I used some formaldehyd, and the tooth was filled up; that evening he went to one of his friends in his neighborhood and had the tooth extracted. It began to swell.

Dr. DAILEY. There seems to be a divergence of opinion. I heard a statement that eucalyptus should be used. If the gentleman will try eucalyptol, the absolute drug, and also bergamot absolute, and the cinnamon, he will do away with the irritating quality in the commercial oil. The use of essential oil and its antiseptic value is greater than anything I know of.

Dr. PERRY. I think this paper is a model for conciseness and correctness. It hits the nail on the head. It is not a big head either and you must strike it squarely.

Mr. President, I wonder how long ago it is that you mentioned, in a paper called "Offerings," the little round, bibulous paper points for drying root-canals?

The PRESIDENT. At least twenty-five years.

Dr. PERRY. Probably a year after that, I commenced the use of the gutta-percha points. They were suggested by your paper. I thought if the little papers would dry it well, the little points would fill it well and with a little instrument, held in the lamp, these were rolled out; after a number of years I presented them before this society—red gutta-percha points. I never had the credit

of it, but that does not matter. I used them for a number of years, but I found after a while that, although they seemed to fit well and the root-canals seemed to be dry enough around them, they almost invariably came out with a bad odor. Feeling sure that there was germ action going on wherever there was a bad odor, I went back to filling with zinc oxychlorid, because I had seen for so many years that this material used by all kinds of operators—good, bad, and indifferent—seemed to do well. It was only a natural conclusion to believe that it was the antiseptic property in it that was the saving quality. There was danger in using it in cavities that were large at the apex, so there seemed nothing to do but to close the apex with little points of gutta-percha, and I used to sometimes even measure the size of the opening. I always measured the length with little barbs and I sometimes measured the opening with a little gutta-percha point warmed, and then perhaps filled it up with that same little point by pushing it gently.

Dr. Atkinson used to say, Always fill the tooth solidly and firmly, and, if it need any treatment, help it to break out or let it break out and fill it from the outside. I think you will find a repetition of that statement for a number of years. I never agreed with that. I am a coward and timid; I don't want to have a patient suffer very badly; I would not like to be in that position myself. I have always filled them with a little undercurrent of fear that there might come a time when the filling would have to come out, and I must agree with Dr. Hart in his desire to use something which will come out easily if it be necessary to remove it. I must agree also with Dr. Rhein that the ideal filling has not yet been found, and I must agree with Dr. Evans in the main that infection often comes from the outside; but I believe in closing both ends.

Perhaps some of the younger men may think I am careless, but I do not care so much what I fill the canal with, so long as the apex is closed, because I expect to fill the other end accurately with my fill-

ing. I have seen the ends filled with cotton, without a particle of odor; and if there be no odor I have no fear. Dr. Evans said he has no trouble with teeth that he has devitalized. We have no trouble with the teeth *we* devitalize; that is a horse of another color; but it is the diseased teeth that bother us—those that have been dead for some time. There comes the opportunity for search for a more perfect filling than we have.

I gave up the gutta-percha points because of their bad odor, due to their absorption of secretions. Take them out after they have been in the tooth for a number of years, hold them over a lamp or put them under your nostril and you will find a little odor from them every time. Gutta-percha swells, and it is natural that it absorbs. I fell back upon what the older members had used for a long time so empirically but so successfully, the zinc oxychlorid; it had the quality which Dr. Atkinson used to favor, but which I did not—that you could not take it out. It is a hard filling to get out, and a hard filling to get in, because the air is sure to get in and you have to work very accurately to fill those little ends with zinc oxychlorid; so after being dissatisfied quite a number of years in trying to fill with this material carried with cotton or silk into the apex, I took a hint from Dr. Wililam Morrison, who used to fill the canals with gold wires, three or four of them—making sometimes the best filling and sometimes the very worst I have seen—reasoning that in those little hair-like canals a bit of silk or cotton twisted on a fine jeweler's broach would make a perfect filling if you could leave it up there. But, as you could not leave it, why not take a little fine gold wire, roughening it a little and twisting on it a few fibers of silk, and there you have a duplicate almost of the instrument with which you clean the root; then take the zinc oxychlorid, mixed very thin, first having swabbed the canal up to the apex, in order to be sure you have it wet, with the very thin oxychlorid; and then, with the fine gold point with the zinc oxychlorid wrapped around it and car-

ried up to the very end, you know you have it filled; and I think it is one of the best things ever used by the profession—I came to that conclusion because of the observation of those old empirical cases—leaving a little portion extending into the pulp-chamber so you have enough to get hold of, if you have to remove it. I think to-day there is no way of filling those very minute cavities on the buccal sides of the upper molars and in the bifurcations of the lower molars, as well as with a little gold wire filed down and fitted as accurately as possible, put in as I have said.

This filling of Dr. Hart comes the nearest to that idea, and it may be better in that it can be more easily removed than even the gold wire with the oxychlorid. What I should fear is that it is not quite stiff enough on the point sometimes to carry it where you wish. It might double up when the gold wire would not. Do not use soft gold; 14-k. or 15-k. tempered gold is better—one which is stiff and springy and which will carry it up to the end. Sometimes I fill an upper molar with those little gold wires on the buccal side, and sometimes use the red gutta-percha points in the palatal root. That I have done sometimes in the last few years.

When it comes to the filling of the pulp-chamber, I do not know what to fill it with to-day. Dr. Jack has written me twice within a year on the subject of two split teeth, one of which was under my observation and another which he told me of, which he thinks were split by the expansion of oxychlorid in the pulp-chamber. I never saw a case which I could be sure was caused by the expansion of the zinc oxychlorid, except this one which came into my hands. It was a good sound tooth split right open. Within three or four weeks Dr. Jack has written me of another tooth split in the same way, and he said he was about to abandon the use of oxychlorid in the pulp-canals.

There is one bad feature even with the gold wire: While you may be very sure of getting the fit accurately near the apex of the root, you are liable to have

a space around the end of the root as it approaches the pulp-chamber; and if you have not enough material to flow back and fill that up, you have a nasty place which is hard to fill. I think that perhaps Dr. Hart's method is better, because you can fill it well before you put the tin wire there and you can take the tin out any time you wish, which I think is essential. I do not think an absolutely perfect filling has been found, and that is why you find so many people using different things. I have thought sometimes one of the best fillings we could have, if it could be made, would be such as Dr. Maynard used to make, which could not be removed but which gave perfection of fit. I have several times within the last twenty years opened teeth which he filled with gold and observed how perfect they were. I have seen the instruments with which he put in the gold—each little piece packed in solidly, giving assurance by the sense of feeling that they were perfectly filled. There were no cesspools there and no chance of weeping from the end of the root. That is where I think Dr. Evans is mistaken; I think fluid can weep into it. I think it can run down and moisture can get in there when the filling itself from the outside is absolutely tight. So it is best to fill both ends absolutely tight, and then in the middle it is not so important.

Dr. EVANS. I spoke in regard to the infection. I invariably close the apex of the canal most carefully with a little point of gutta-percha, measuring it carefully. I cork it, as I say, and fill one-third, sometimes one-half, with gutta-percha, and then fill the remainder with oxychlorid. I have found nothing in recent years which surpasses or even equals Ash's rock cement. I carry it up there generally with a few fibers of cotton.

Dr. HART. I stated what I liked to do after the canal was prepared, and I purposely did not enter into the treatment of that canal, because I think we are all of one mind that it must be in an

aseptic condition, even if we are not all agreed just as to what we will put in. Concerning infection from the apical space, I have seen a central incisor that had received a blow but which had no cavity. As a result the pulp died and an abscess followed; and how infection took place except through the circulation I cannot say. If Dr. Evans be correct it would become unnecessary to do any more than seal the pulpal end of root-canals with oxychlorid, put in a good filling, and we would have no trouble.

As to any odor connected with this material, if you can find that that is a disagreeable thing to use, I will concede that it is; at present I do not. I have tried the mixture of aristol and the essential oils. It is not as thin, and it becomes somewhat sticky and gummy—there is the difference between working gum and a thin vaselin-like mixture.

It would be inexcusable for any one of us to have any septic irritation after devitalizing and surgically removing a pulp, and I am not wasting your time or mine considering such cases. I am speaking of cases where a pulp has become purulent after exposure; treating that tooth as well as we can with chemical sterilizers or by heat, we get it in a condition where there is no pericemental irritation and it is aseptic and ready to fill. I want to put a filling in there that I can remove. I am not arguing with any of you as to how we can treat roots after we destroy the pulps, or after using some local anesthetic removing those pulps, but as to how thoroughly we can sterilize the dental tubuli. Once we treat a root that has been the seat of peridental inflammation, we know that one inflammation predisposes to another, and it may end by suppuration. Until our knowledge of bacteriology is changed, I want a root-canal filling that if trouble arises I can remove.

Adjournment.

ELLISON HILLYER, D.D.S.,
Editor N. Y. Odont. Soc.

IOWA STATE DENTAL SOCIETY.

Thirty-ninth Annual Meeting.

(Continued from page 314.)

THE next paper read was one on "Oral Hygiene," by I. P. WILSON, D.D.S., M.D., of Burlington, as follows:

ORAL HYGIENE.

With only a few hours before me for the preparation of this paper, I feel that I cannot do myself or this society justice.

The study of prophylaxis, of oral hygiene, pathology, and stomatology has attracted the attention of the dental profession more of late years than ever before. The medical and the dental professions, as well as the laity, have been slow to realize how much the general health is dependent upon hygienic conditions of the oral cavity. Our school physiologies contain but little that is of real value regarding the teeth and the mouth. Indeed, the meager teachings they do contain are not only indirect and vague, but in the main are misleading and erroneous.

Coulton's "High School Physiology" states that "The wisdom teeth make their appearance about the twenty-fourth year." The same author says that "The teeth should be thoroughly brushed at least twice a day, on rising and on going to bed;" but he adds, "It would be better to clean them after each meal also." The same writer suggests that "In using toothpicks care should be taken not to dislodge fillings."

It will be noticed that Coulton is in error as to the time of erupting the third molars, the age of eighteen or nineteen being more nearly the average time. His advice as to the care of the teeth is by no means satisfactory. He says, "Brush the teeth twice a day, on rising and on going to bed." He then adds, "after every meal would be better." After every meal should have been made em-

phatic. "Twice a day, first before breakfast, and again before going to bed" had better been omitted from the text-book. Brushing the teeth after the last meal of the day is valuable advice, but coupled with what precedes it the advice here given teaches a lack of thoroughness, and the result of such loose teaching is noticeable in our young people. It takes less time and energy to brush the teeth twice a day than thrice, and so our pupils form a habit, based upon the teachings found in the school physiology, and they brush their teeth but twice a day, the first time being before breakfast. Three meals are then taken before they are again cleaned. The particles of food left around the teeth from the breakfast undergo fermentation before night, and a fruitful field has been provided for bacteria. We cannot too strongly urge the importance of always cleansing the teeth after meals. Eating candy and pieces between meals is ruinous on both the stomach and the teeth, and if such a bad habit be indulged in, let a brush always be employed at once to clear away the debris.

The unnecessary caution given in this text-book regarding the dislodgment of fillings from the use of toothpicks would be amusing were it not an unwitting reflection upon the skill of the dental profession.

A subject of so much importance deserves more than simply passing notice in our school physiologies. We should go directly to the children and teachers with plainly stated facts regarding hygienic conditions of the oral cavity. The dental profession should provide such a text-book for our public schools. Such a work should contain nothing but practical teaching regarding the care and preservation of the teeth, the prevention of

disease, the cause of deformed teeth, and the influence of an unhealthy condition of the mouth upon the general system.

This reform, it seems to me, can only be brought about through the children in our public schools. Parents whose habits and prejudices have been formed are not easily convinced of the necessity of using the brush and properly caring for the teeth. This is especially true of our country patients. They will tell us of their fathers and their grandfathers who lived to be seventy-five or eighty years of age; that they had good teeth, and yet never used a brush. Their children are taught by precept and example that brushing is injurious, and again they refer to the good teeth of their aged parents, who never used a brush in their lives. It is well to remind such people of the fact that there are comparatively few of any generation who live to be eighty years of age, and that, from a physical standpoint, they exemplify the "survival of the fittest." They are those who have inherited good constitutions, and who have attained to length of days in spite of neglect and violation of the laws of hygiene. It should be remembered that more than half the human family die before they are half of four-score years. At least three-fourths of our race would lose the most of their teeth, were they totally neglected, before middle life, so that old people who have good teeth and yet have neglected and abused them all their lives do not owe their preservation to lack of cleanliness, any more than an octogenarian can attribute his great age to the lifelong use of tobacco and whiskey. The time has come when the dental profession should act, and act wisely, in regard to educating the public on the subject of oral hygiene. I make the strong statement that I firmly believe that no one thing can have more to do with the comfort of the human family, with the health of our race, and with longevity itself, than clean, healthy teeth and gums. To one who has not given this subject careful study and observation this statement may seem unwarranted and without founda-

tion, but let it be remembered that mastication is the first step in a series of processes for the digestion and assimilation of our food, and that unless this process is thoroughly and hygienically done, the digestive system and the general health must suffer the consequences.

Food cannot be well masticated with diseased and aching teeth, nor in the absence of a part or all of the molars and bicuspid, nor is the food clean and healthful after being masticated by such teeth. And then neglected teeth, covered with decomposed vegetable and animal matter, not only vitiate the food before it reaches the stomach, but poison the life-giving oxygen before it reaches the lungs. Such neglected teeth will often produce a stifling breath, greatly to the annoyance of friends and associates.

Under such unfavorable conditions, how can the blood—the great storehouse of the physical organism—be supplied with rich nutrient material for building up and replacing the broken-down tissues of the body?

I believe that any closely observing dentist will bear me out in the statement that an organism thus exposed is an easy prey to disease. How often we meet with persons in our daily practice with sadly neglected teeth, suffering from loss of appetite, indigestion, neuralgia, headache, and general debility as the direct result of an unhealthy condition of the dental organs. In many such cases the health is rapidly restored by correcting this abnormal state of affairs and bringing about a sanitary condition of the teeth and gums.

My observations for more than a quarter of a century have led me to believe that typhoid fever and kindred diseases are not infrequently the result of the effluvia arising from decomposed vegetable and animal matter in and around the teeth. Why should it not be so? We all admit that rotten vegetables in our cellars and poisonous germs in the water we drink will breed disease. Why should not these same enemies to health, abiding in the mouth for days, weeks, months and years, do the same deadly work? I am not theorizing, but stating facts based

upon close observation. Henry Ward Beecher once said to his congregation that people were too apt to speak of sickness and death as providential. Then after pausing for a moment he continued, "Providential nonsense! Take the rotten potatoes out of your cellar!"

So-called nasal catarrh, of many years' standing, not infrequently has its origin in an abscessed molar, discharging pus into the antrum of Highmore and out through the nose. Fistulous openings from these abscesses are usually found upon the gums, and the discharge takes place into the mouth. In some cases the outlet is upon the face, the lower border of the jaw, or the neck, and in some cases an abscess of a lower third molar will find an outlet into the pharynx. A sanitary condition of the mouth cannot be established until the offending member is either cured or extracted.

But in preparing this short paper, my first thought was to direct your attention to a movement inaugurated by Dr. Richard Grady, urging the National Dental Association to consider the subject of oral hygiene in public schools. At the instance of Dr. Grady, the National Association appointed a committee of five—viz, Drs. Richard Grady of Maryland, H. H. Johnson of Georgia, I. P. Wilson of Iowa, F. W. Stiff of Virginia, and W. E. Walker of Mississippi. This committee was organized by electing Dr. Grady chairman and Dr. Walker secretary. These two gentlemen deserve the credit of doing almost all the work that has thus far been accomplished, and the profession owes them a debt of gratitude for the earnest work they have already accomplished. And it is to be hoped that the members of this society will stand ready, with other state societies, to co-operate with the National Association, through its committee, in collecting statistical information as suggested by the committee. (See report of committee on page 222 of the proceedings of the National Association for 1901.)

I have no doubt that a small, concise text-book on oral hygiene under the sanction of the National Dental Association is forthcoming, which will of course con-

tain correct information regarding the teeth and their care. There may be a question as to the wisdom of preparing a book on that subject alone. If the National Medical Association would take upon itself the task of preparing a suitable text-book on physiology and hygiene, and the National Dental Association furnish a distinctive part of that work on oral hygiene, it might meet with more general favor, as an additional text-book would not thereby be needed, which would remove the objection to having an additional book that has already been urged by some of our educators.

The subject of oral hygiene has been one of deep interest to the writer for many years. The necessity of educating the public on this very important question has led me to spend much time in giving instructions to parents and children regarding the preservation of the teeth and on the sanitary condition of the mouth. And while a great deal of valuable advice has been wasted, yet I have the satisfaction of seeing some good results from my efforts to benefit my youthful patients.

My brethren, there are some things in our profession that are worth more to us than money. The satisfaction of benefiting our fellow man when dollars and cents are not spurring us on to duty gives us a warmth of heart for our fellow beings, and a satisfaction of mind, that enlarges our better nature and makes us happier from the consciousness of having rendered loving service, and this makes us better men.

Discussion.

The PRESIDENT. Dr. W. H. DeFord will open the discussion on Dr. Wilson's paper.

Dr. W. H. DeFord. The subject before us—viz, prophylactic treatment, internally, for diseases in the oral cavity, is one of the most important of any in which we are interested. If we can combat disease in the oral cavity before it attacks the teeth, and before it is taken into the system and attacks the other tissues, we certainly have done a great deal for the benefit of our patients. It is very much better to prevent disease

than to cure it after it has fastened itself on the human system. I am heartily in accord with everything Dr. Wilson has said, and am willing to do everything I can to bring this subject more prominently before dentists, dental societies, and the laity, so that we may make greater progress, along dental lines, toward promoting the health of our respective communities. The doctor's suggestion to have some action taken along this line by this society and other societies is a good one.

The PRESIDENT. From our invited guests we should, of course, like to hear in the discussions on any subject. Are there any further remarks on this subject?

Dr. G. V. I. BROWN. I will take advantage of the opportunity given to make a few remarks. The paper has for me a double meaning—in the intrinsic value of the ideas presented, and in the fact that having known Dr. Wilson for many years I know him to be a conscientious laborer in this field. I feel called upon to emphasize some of the ideas brought out. In the first place, the work of the National Dental Association should receive the co-operation of this state society and of every other state society. I trust—and feel sure, knowing you as I do—that it will receive the co-operation of this body. There is another factor, however, working with us, that has been overlooked, and that is the American Medical Association, many of whom are becoming very much interested in this subject. In the section denominated "Stomatology," which you know is the dental section, practically, of the American Medical Association, there is—and has been for years—steady, active work in trying to bring this subject—its true purpose and the valuable ideas connected with it—before the minds of medical men; and I think you will all find that medical practitioners, at least the better ones among them, in your communities will be very ready to co-operate in any movement which may look to the interesting of teachers and those in charge of educational institutions. Only recently in Milwaukee the oculists have been re-

quested to make examinations of the eyes of the school children, and a number of prominent men in the city have volunteered to give their services free. We contemplate urging in our local dental society that this be done with regard to teeth also. I trust in your communities you may be able to do this. One of you being a mayor should make it an easy matter in this community at least, and if you use the prerogatives you have here, there, and elsewhere, there will be no doubt as to the result.

I want to say further that, as some of you know, I have a number of lantern slides illustrating this subject in an interesting way and designed to call the attention of the laity to the ideas we deem the most important. If any of you feel inclined to take up this missionary work in your own localities and give some lectures, as I have tried to do in Wisconsin, I will be very glad indeed to send the slides and let them be used wherever you see fit.

I trust this matter will not go with mere approval; the ideas of the paper are too valuable, the essential thoughts are too nearly what our hearts yearn for and are constantly stirred about, and I hope that some active, definite result will come from this paper.

Dr. PARVIN. I would like to make this statement, more for the purpose of getting information, perhaps, in regard to advising my patients as to the use of the tooth-brush; they often say to me that the latter makes their gums bleed so they can't use it. Now, I acknowledge that I am at a loss to know what advice to give them. It has been my custom to impress upon their minds that the object in brushing the teeth is not so much to remove the discoloration from them as to remove the food-products from between the spaces, and I instruct them that it is more to be used for brushing than for scrubbing, and advise them to continue the brushing, but to practice it oftener and not so long at a time.

Dr. J. B. ENTRIKIN. I would like to say one word in reference to mouth-washes. I would like to ask how many are using pyrozone, and if they know

when they are using it that they are using a preparation having an acid reaction? It is very well to destroy bacteria, but is also well to be careful in what way it is done.

Dr. E. T. BRUNSON. In reference to the remarks made by our friend here as to what to do with the patients who complain of the brush breaking through their gums and causing them to bleed, we have, of course, the one great cause, salivary calculus; after it has been removed, I find it beneficial to instruct patients to continue the use of the brush on the gums in spite of the temporary bleeding and tenderness.

Dr. WILSON (closing the discussion). I was very glad to hear my friend Dr. Brown. I did not know that he was in the room until I heard his voice. I am glad to know that the oculists have taken the step they have in regard to the examination of teeth of children in our public schools. We have found considerable difficulty in bringing that matter about, as we have to reach the school children through our boards of education. I have the honor of being a member of the school board of my own town, and I thought, "Now, that will act as a little leverage; those gentlemen are friends of mine, and I can bring this matter before the board and carry out the suggestions offered before the National Association." But to my surprise, two of the most prominent members of the board—legal gentlemen, for whom I have the utmost respect—objected, and claimed that we had no more right to go into the public schools and ask the teachers to allow the examination of children's teeth than the oculist or any other specialist had a right to go in and say that he wanted to examine their eyes, or other organs of the body; and so I had to drop the matter.

But, gentlemen, it is a question that will not down. The thing that Dr. Brown spoke of as having taken place in some other city is evidence of the fact that the public is thinking on this matter and is being educated in regard to its importance. A suggestion was made, as I understand, by our president in his address that this subject should be pre-

sented in the State Teachers' Association. It seems to me that this is a wise suggestion, and I most heartily indorse it. In regard to the gums bleeding easily from brushing, my friend on the right has well said that people who neglect their teeth are the ones who make this complaint. Decomposed food and tartar irritate the gums and they bleed easily. This does not argue that the teeth should not be brushed, but it does argue that they have been neglected, and this we should explain to our patients; we should educate them.

Someone, I believe, spoke of the difficulty of giving parents and patients advice upon this subject—what advice to give them. I should say the simple plain advice to keep their teeth clean. In a few words show them what decomposed matter around the teeth means; that it means a diseased condition of the gums which invites an army of bacteria to make inroads upon the teeth and the general health of the whole system; and so I should give them good advice. People who neglect their teeth are very apt to ask you what kind of tooth-powder they should use. My answer nearly always is about this: "Brush, water, muscle. Never mind about tooth-powder. You must do this work yourself; you must do it thoroughly, and you must brush your teeth after every meal." And in more instances than one when I find there has been total neglect of the teeth, after examining the teeth I have postponed their appointments until another date—put them on probation; and when they have come back, if I find that nothing has been done toward keeping the teeth clean, I refuse to do their work. In several cases I have refused to go on with the work on the ground that my reputation was at stake; that it would be impossible for me to save the teeth unless they co-operated with me. And a dentist can usually convince his patient of the importance of the subject if he comes squarely at them in this way. He has a right to do so; it is his duty to do it. It would not do when we meet a friend on the street to say to him, "Your teeth need cleaning," or "You have bad

teeth; they are unsightly." That would give offense; but in the position we occupy as dentists it is our privilege and our duty to talk to our patients very plainly on this subject; and we can do so without being offensive, and the majority of thoughtful people will thank us for doing so.

Dr. ENTRIKIN referred to cleansing the teeth with hydrogen dioxid. I have never used it in that way, except in treating pyorrhea alveolaris, but another preparation akin to that, known as "dioxogen," is coming into use, and I have used it with satisfaction. There may be some danger in using that preparation, as the doctor has suggested, and I shall use it with more caution hereafter. I remember that the manufacturers of pyrozone caution against the use of a metallic syringe, and I stopped its use. I accept the words of caution from the doctor. I have been using the dioxogen in my own mouth a little almost every day, and find it an excellent thing to cleanse a full set of artificial teeth; one who is wearing a plate will do well to pour some over the plate every day; it will cleanse it and remove the odor. The same is true if you take a little of it in your mouth; it will cleanse the teeth, and purify the mouth.

Dr. ENTRIKIN. That is the point I want to make: It will injure the mucous membrane.

Dr. WILSON. Thank you. I have been using it myself and have advised it with one patient, who has become delighted with it. I must say that when I use it I feel that I have a clean mouth; and yet that does not prove that it is harmless. I shall make note of the suggestion of Dr. Entrikin in regard to the matter; I know he is a close observer.

Dr. BROWN. I wish to say one word about dioxogen, and to call attention to the distinction between this preparation and other forms of hydrogen dioxid, hydrogen peroxid, etc. The oxygen is usually held in solution by an acid; the oxygen is extremely unstable, and that acid in the course of time, if the preparation stands, becomes very markedly increased. I have had some preparations that I have

kept for a year or two at a time, and they became extremely acid; so much so that you could taste it. Dioxogen is as nearly free from acid as it is possible to have it; it is claimed that there is no acid in its composition. As to its being injurious when given in quantity sufficient to be so, this is certainly true. I depend upon it to keep the mouths of babies clean when I have performed a cleft-palate operation, and it disturbs digestion less than any other antiseptic agent. A baby begins to suck immediately when anything is put in the mouth, and you can be sure that a little of any substance that may be used as a mouth-wash will go into the stomach.

The effect of the statement of Dr. Wilson is important. I had some experiments made, and made some myself a few years ago, to test various antiseptics in the mouth. Perhaps some of you may remember it. I found that I could sterilize a mouth with three per cent. carbolic acid until the culture tube would show no growth; then rinse the mouth with mercury bichlorid about 1:5000 and again take the test and get no growth, immediately following in the same mouth with dioxogen and growth of germs. But if dioxogen were used, any of these solutions could be used and the culture-tube would show no growth. That was explained in this way: The carbolic acid, mercury, and those antiseptics, destroy the germs they come in contact with upon the surface, but in the mouth the secretions, dead mucous cells, and animal fats cover over and protect the surfaces so that the actual germicide does not come in contact with all the microbes. In order to cleanse the mucous membrane of the mouth for operation—and I am obliged to do it constantly—I find it necessary to have mechanical cleansing. Scrubbing, to which Dr. Wilson refers, is the best of all; when that is not practicable we have the mechanical action of the dioxogen, which breaks up the animal fats and mucous covering. After having used dioxogen any of the other germicides will destroy the germs completely.

Dr. ENTRIKIN. I would like to ask

Dr. Brown if he considers dioxogen non-acid or only slightly acid?

Dr. BROWN. It is claimed by the manufacturers that it is non-acid; they claim a special method of preparation which makes it superior to other similar preparations. In a general way you may perhaps count on a percentage of acid, but no such percentage as you have with the other preparations where acid is used to keep the oxygen in solution. It certainly is not acid to such an extent as would be injurious. My patients use it the year round and depend upon it, and never have had any ill effect at all.

The PRESIDENT. The next paper will be one entitled "Experience of a Country Dentist with Porcelain Work," by Dr. W. G. CRANDALL, Spencer, Iowa. (Printed in full in COSMOS for May 1903, at page 372.)

Discussion.

Dr. WM. FINN. I think there is one point we all fall down on in this work. It is not necessary to cut the root off below the gum; it may be left two millimeters long, and made smaller in diameter by cutting the labial or buccal surfaces, so there will be room for the platinum band and the thin porcelain facing; in this way you do not infringe on the gum.

Dr. BAKER. I am rather sorry that this paper came up at this time. I should like very much to have had this paper and discussed it when Dr. Reeves of Chicago was with us. He is an expert in this kind of work, and I do not know whether his paper is along this line or not; I hope it is. But this seems to be a line in which there is an interest all over the country—in fact, all over the world—and there has been much misunderstanding and much said, I think, that is without warrant.

First, I want to speak of some of the things that come up in the paper. He spoke of the difficulty of investing. Now, as I make these crowns and have seen many others, I do not think that, save in exceptional cases, it is necessary to invest. I think much better success is attained by leaving the porcelain face

entirely open, provided one is not compelled to invest so as to hold the facing in position on the cap. As a general rule, however, the pins of the facing will clasp the post which enters the root in such a way as to hold it in position. Then put the crown in the furnace, and you will find that the crowns will never crack or check; I never had one do so when treated in that way, and I feel safer, because the heat affects all surfaces of the porcelain and it is heated up evenly. If we cover the porcelain, investing on one side and leaving open the part of the porcelain next to the pins, I believe the porcelain is more apt to crack than with no investment at all.

Now, as to the solder. I think pure gold for solder, if you are using a high-fusing porcelain, is entirely out of place; I do not think it should ever be used. The one main point, one of the finest things in the development of porcelain work, is in the use of solder that will not be fused at the highest point to which you carry your heat for fusing your porcelain. Use platinum solder, twenty-five to forty per cent. If you use the highest fusing porcelain you can use forty per cent. solder. Now, in order to use this platinum solder, it is not necessary to have special appliances. If you have a common nitrous oxid cylinder and a yoke, and will attach a rubber tube to it, all you need is an ordinary blowpipe. Attach your blowpipe to the nitrous oxid cylinder and the illuminating gas. You will find that you get a flame that will melt the forty per cent. solder just as easily as would a special make of blowpipe.

As to the different bodies: I have made many experiments with the high-fusing bodies, and I have found as a general rule that they are more apt to bubble and become porous than the low-fusing bodies. I had been somewhat prejudiced through reading and hearing from others in favor of the high-fusing bodies up to within a few months, but in crown work I have had very little trouble with this bubbling; yet once in a while a bubble will work to the surface and be just a small glaze over the top of it and break

through, or make your porcelain weak, and you will have to break it off, or it comes off; it will destroy your work and it will have to be made over again. But in the inlay work it has been one of the hardest things and one of the most confusing things, and a work that takes the closest and most exact work in mechanical skill. I have worked over this inlay work for—well, it is about nine years since I first began inlay work of this kind. Before that time I put in some inlays that were ground from particles of teeth, but when the Downie porcelain first came out I worked with that, and then with the Land body—with the Land body that Land never made himself, but which the Wilmington Company made at that time—and I have quite a number of inlays that are still in made nine years ago. But they were made of the Downie body that was porous, and you could not grind them down and polish them, or they would become discolored so that they were nasty. I have some of those that happened to be fused exactly right that are still in good shape, and if the surface has not been ground at all, they still are glazed and are doing service; but with the Land—the Wilmington—body I had better success than with any other. The Downie body when first brought out, I believe, was a failure. But at that time I became somewhat discouraged with the work, as the cavity preparation, I believe, was a thing that we had not mastered as we have at the present day—and cavity preparation in inlay work is one of the most important points we have. I do not want to go into the description of that, as the essayist spoke of it specially; but these different bodies will be shown, I believe, in our clinics of the next two days. I hope to give clinics in that line, using both the high- and the low-fusing, or Jenkins body.

Dr. CRANDALL (closing the discussion). I have nothing to say on the subject further than I have said in the paper. Dr. Finn brought out about it not being necessary to grind the root as deep as for a Richmond crown, which I regard as a very good point. It is a fact, too, that in removing the enamel it

should be brought back in such a form that you can put the edge of the facing over your cap, after filling the small crevices with enamel body. This makes a very nice appearance and unites the facing very firmly to the cap. Many people do not like that band in the gum, and I find that the plan mentioned works very nicely.

The question of high- and low-fusing bodies it is hardly proper for us to decide here. I have seen considerable work done by the Jenkins body which was very nice indeed. But you have got to be very careful in using the low-fusing bodies, and that is more or less the case with all bodies.

Speaking of the blistering that sometimes attends the baking of a crown, we can almost always attribute it to the excess of gold, and it is well to avoid that excess of gold in all cases. I always use a small pellet of foil to solder with, and in that way you get a small amount of gold. Of course it is not necessary, as the doctor speaks of, to always invest a case. I very often flow my gold in the furnace. It is much nicer to get along without investing if you can. I think you can find that by biscuiting instead of fusing in the first baking, and by using the minimum amount of gold or platinum solder, that the blisters will be very scarce, and of course in the second baking you can run your heat up until you get your proper finish.

Evening Session.

The PRESIDENT. The exercises of the evening will open with a paper by Dr. W. R. CLACK of Clear Lake, on

SOME PECULIAR TEETH.

Dr. W. R. CLACK. My paper will be notable for its absence of a paper. It is more of a little talk over some experiences I have met with in my practice.

The first thing I will mention is this: I have in this little bottle two teeth. The only peculiarity connected with them is that they were fully erupted in the mouths of infants at birth. I will pass these around directly. The longer one—the lower central incisor—was wholly

erupted, left in the mouth, and in about three weeks that child was brought back to the physician with the complaint that its tongue had a little hole in it and was so sore that it could not nurse. The parents examined the mouth and did not know what the trouble was, and when the physician came to look into it, he found this central incisor erupted. He took it out; it was in a little encysted sack and not fully developed. The other is an upper central incisor. This child was born near Clear Lake about three weeks ago, and, as the physician told me when he gave me this tooth, "unluckily the child lived." It is decidedly abnormal in other ways, and the mother gave her life in giving it birth. There were two teeth erupted, and you will readily perceive which is which. He gave me one of them. I pass these that you may see them.

Those of you who attended the National Society meeting last year will remember the talk on implantation and replantation and the result. This tooth [showing tooth from another bottle] I am told was replanted about three years ago. The gentleman was not my patient at that time, but he came to me a few weeks ago from a neighboring town, having broken this tooth off, and said it was awfully sore and kept "running" all the time. On making examination I decided that absorption had taken place, and so I picked it out. You will see there has been nothing broken off. There is absolutely nothing left under the edge of the gums; the absorption is just as you see it there. You will see that the stand taken by Dr. Black last summer at the National Society was this, that he never knew of a replanted or implanted tooth that lasted more than a few years, and that it was always removed by absorption. If I understood him correctly that was the ground that he took, and this is just one more evidence that he was right.

The principal matter, however, to which I wish to call attention is this: Last summer one of my patients from a neighboring town was visiting a friend in Clear Lake who had lately moved there, and she said, "Mrs. S. has the funniest

teeth you ever saw; they are double all around." You know we have all heard so many times about double teeth all around, and I said to the lady, "I will give five dollars to see a set of teeth that are double all around." She thought she had a snap and she said I was to come up and see them. I went up, and found no truth in the statement, although she had a very peculiar mouth indeed. The teeth had no crowns. Nearly all of the teeth are present, but they are little conical stubs just through the gums. She told me that she had never had any other teeth; that the teeth were her temporary teeth. That I found was not true, because I could distinguish the outlines of permanent teeth and there were more teeth than would have been present had they been the temporary set; bicuspid in place of the temporary molars showed that they were not deciduous teeth. Then she called my attention to her little boy, who was five years old, and he had just such a condition of mouth. She tells me that her mother and three of the children of her mother's family, her uncles and aunts, had this same peculiarity, also her grandmother and the younger children of her grandmother's family; there were three of the older children in her grandmother's family who had perfectly normal teeth. This had never occurred, to her knowledge, on either side of the family before, and the older children of this family had perfect teeth. To begin with, this grandmother and all the younger children in her family had this peculiarity; then in the next generation there was one child who had perfect teeth; this lady had one brother who had good teeth. She has two brothers who have the same peculiarity as herself. I will pass around to you the impressions taken from her brothers' teeth. I was unable to obtain an impression of the lady's lower teeth. They are very peculiar indeed. I think any dentist seeing this lady or her brother or her child would immediately recognize that there was something out of the common in her facial appearance. In the first place they are people of very fine bone; another thing, there is that ap-

pearance of unrest about the mouth. You would probably say, if this lady's mouth were closed, that she had artificial teeth that were too short, the nose and chin approaching too closely together, but if she began speaking to you, you would say "Why that lady hasn't any teeth at all." These teeth don't show. In conversation she is obliged to laugh very heartily for you to see those little stubs. The child's bone is not larger, I think, than ordinary children of three and a half or four years of age.

But the main reason why I bring this particular matter to your attention is this: This lady told me the condition of the mother and I mentioned that anything that we could suggest should be done as quickly as possible for the benefit of the coming child. There was so short a time that we did not have much hope of doing anything; but did begin giving her calcium phosphates, Phillips's milk of magnesia, and some things suggested by her physician, whom I consulted on the matter. The child is not over six months old now and of course has no teeth erupted yet, but the mother has continued the medicines, and she has been giving the child in a little food some of the materials that we hope may build up his system to such an extent that he may have normal teeth.

If any person can throw any light on this subject, either as to the cause or as to the remedy, I shall be very glad indeed.

Discussion.

The PRESIDENT. Dr. Clack's verbal report of these cases is now open for discussion.

Dr. G. V. I. BROWN. This is an easy case to talk about, but a very hard case for one to tell what to do. As a matter of fact it opens up a very interesting subject for discussion, which is the subject known generally under two heads—one is what is known as degeneracy and another the atavistic tendency. By an atavistic tendency we mean, of course, reversion to a so-called animal type. There are also developments of other features which have the same significance and are recognized as atavistic. On the

other hand, with the condition of degeneracy we have usually an arrest of development. It may be perceptible in one part or it may be another—the nose, jaws, some of the bones of the face, or sometimes, as in this instance, the teeth. There have been many cases on record where there have been no teeth at all. You all have known instances where one or more teeth are missing. I should say that Dr. Clack has done everything that any reasonable individual could do. In the first place, as I understand, you had to do with the nourishment of the mother and afterward of the child. How early did you get at the nourishment of the mother?

Dr. CLACK. About two months before the child was born.

Dr. BROWN. Well, that ought to help. Of course in the condition of the bones in these cases, as a rule, those remedies which we would apply, and those cases which we consider to be suitable for such treatment, would be undertaken too late. It is at the sixth or seventh week, perhaps at the latest the seventh week of intra-uterine life that such conditions begin; that is, things are under way, proper development and formation of parts of the jaws, and very few of us know very much about what happens in the intra-uterine period of life before the fifth or seventh week. Remedies which are applied often in good faith are really of little use because the time has passed when anything beneficial can be effected. In this case I am inclined to think good results may ensue. I would suggest one thing, and that is, to observe very closely the order in which these teeth are developed. I am very clearly convinced from some of my recent investigations that the lower jaw has all to do, not only with its own development, but with that of the upper dental arch as well, and it may be that the lower jaws in these cases have something to do with this apparent condition of the enamel. I could not tell from these cases; I have been examining them hoping that I might understand. The number is complete, the full number being present in order, except that the enamel of the teeth is wanting.

Dr. CLACK. Yes, sir. I will say, however, that I think these teeth are deficient in the length of the roots. This lady, you will notice, has lost one. I could hardly get her permission to do anything. When I placed the wax in her mouth she made such a fuss that it is quite imperfect. The way she lost this tooth she told me was this: One day her husband had a little stick, about like a pencil, and was playing with it, throwing it like a little spear. He threw it at her endwise and hit one of the teeth, a bicuspid, I think, and knocked it out of her mouth; she was unconscious of it until she felt the blood in her mouth. The five-year-old boy lost a tooth and there are not any signs of eruption of the second tooth. I think it is the lower central incisor and there appeared to be a very crudely developed tooth there as though there was an arrest in the development.

Dr. BROWN. I suppose you made inquiries as to whether there was any syphilis in the family?

Dr. CLACK. I did not do so. The parties are very sensitive and I doubt whether the lady knows anything of it. She was a very ladylike, refined person, and I do not think the subject was ever broached to her. In fact she told me in my talk with her that no physician or dentist had ever approached her on the subject any more than just to laugh at her, and there had been no investigation made whatever.

Dr. BROWN. I will say, Mr. President, that the reason I asked the question is this: It is now a recognized fact in medicine, and also in dentistry, that the so-called Hutchinson teeth, which are pitted and ridged in a peculiar way, are the result of syphilis. Of course that theory is carried to a greater extent than facts will warrant, because many of our patients have fully formed teeth which are full of pits and ridges and are very imperfectly developed, in whose cases we can get no history of syphilis, either in the individuals or the ancestors. But all such conditions belong to the same class. In other words, there is an arrest of de-

velopment. Now, if the arrested development comes from some imperfection in the brain-cells which causes a deficiency in the metabolic change, the result of inheritance and therefore what we term hereditary, or whether it be by reason of some imperfect development of some of the other organs pertaining to the development, so far as we are concerned it is practically the same thing. We cannot go into the matter of heredity and inquire with reference to the grandfathers and fathers, but can only do as Dr. Clack has done, assist the nourishment of the mother and the development of the child, and watch vigilantly in order that it may be fostered and protected against such nervous disturbances as might interfere with and retard the developmental process. Giving this child various phosphates as you are, and surrounding it with such an environment as to have the best possible nervous development will, I believe, give excellent results.

Dr. F. M. SHRIVER. I do not wish to discuss the subject to any extent, but, in reference to the statement which Dr. Clack made in regard to transplanting, or rather replanting teeth, I believe he made the statement that Dr. Black said that in no instance had a tooth remained intact more than two years.

Dr. CLACK. I think he used the word "average."

Dr. SHRIVER. I would not presume to question Dr. Black; I would rather dispute Dr. Clack in the matter and say that he misrepresented Dr. Black; would feel safer in doing so. But I want to speak of a case which I had in my early practice and that dates back about thirty years. I had a patient come to me with an ulcerated incisor, and in those days we didn't know much about treating teeth, nor attempt much. I extracted the tooth. I had discussed the subject of replanting teeth with a certain dentist. His directions were, after extracting a tooth, to scrape off the membrane and to file a very little off the end of the root so that it would not be painful in replanting it. I suggested to the lady that

I could replant the tooth, and she was very anxious to have it done. I went to my table and filled the tooth with gold and replanted it and it did very nicely. In about a year afterward the other central or lateral (I would not be positive which) became inflamed. I extracted, filled, and replanted it. At the end of six years after the last tooth was replanted she came to me with the teeth in a loosened condition and I extracted them. When I first examined them I thought that the root had broken off, but on closer examination I found they were absorbed; one of them had been in six years and the other seven, and they gave good service during that time.

Dr. BROWN. I do not remember just at this moment what Dr. Black said, but I can make consistency between these two statements. A very great number of the teeth that are replanted have practically no life at all; never are successfully replanted; a moderate number do last for a considerable number of years, and as between the two success might be called anything—one year, two years, or what the individual might see fit to make it. Some twenty years ago, when I was a student, the fad of replanting teeth was having quite a sweep over the country, and I happened to be present at the replantation of a great many. It was considered an important thing for business men to be able to stop on their way to the office, have their teeth extracted, and replanted again in the evening as they returned. We thought the average life of those teeth about seven years. A good many of them came back in less time than that, but a fair proportion did very good service for six or seven years, and then they would come out in just about the same way as do deciduous teeth, with the root all absorbed away. I am not prepared now to make a statement as to whether that really ought to be so or not. I am inclined to think that a little care would preserve such teeth for a very much longer time. I had a patient come to me some time ago with a tooth that was on its way out. It had been replanted something like two years before,

and for experimental purposes I put clamps on which forced it back up into the jaw with steady pressure, and then put an appliance on which held it there firmly. That was three or four years ago, and so far as I know it is there yet. I think this absorption takes place a great deal from causes which are not directly the result of the replantation. I should say in regard to replantation that two years was a very fair life for a replanted tooth; on the other hand, there are some cases which last six or seven years.

In using the terms "degeneracy" and "atavism" I gave the definitions usually given for them. The atavistic tendency is merely to recur to the animal. That, of course, would be a definition that might apply to one of Darwin's followers. Degeneracy is a process implying arrest of development. I simply used these terms to illustrate two opposite conditions; the presumption being that with our higher order of civilization, with less use of bone structure, since we do not need teeth for prehensile purposes, as we get our food in another way, there would be—as we find there is—a decrease in the size of the jaws. The idea is this: If the brain cells which govern those tendencies which we recognize as animal tendencies predominate in the individual, then naturally there will be a greater development of the bodily structures, which tend to harmonize by building tissue essential to those particular characteristics. On the other hand, if the brain centers which have to do with the intellect, the spirit, the ideal of the individual, predominate, naturally that individual develops in other ways, since the development of the body is governed by these centers alone in a sense, and bodily growth of course corresponds.

I ran across something recently that interested me very much, and I believe it is the secret of this whole subject when it shall have been developed. It is stated that in recent experiments it has been found that in the brains of dead persons and dead animals, and also in living

animals, there is a tendency to polarization under certain particular excitements precisely on the same basis as are explained the principles of Marconi's system of wireless telegraphy. Now, if the brain is sensitive to these waves as are the instruments of Marconi, thus we have illustrated perfectly all the conditions pertaining to nerve stimulation and the relation between waves of light and sound, of heat and electricity, of all the etherial vibrations that give us sight and feeling, thought and hearing. I trust the future will develop that, and if it should do so, we shall not have to argue these differences as at the present time.

Dr. HINKLEY. A great many patients have come to my notice presenting the same condition of the teeth that Dr. Brown has described—some with an absence of the enamel on the points of the cusps, others with nearly a third of the whole crown denuded of enamel. Some few cases show a defective area near the middle of the crown, while the upper and lower parts are normal. After looking up the history of many of these patients I am led to believe that the cause lies in some disturbance of the general circulation at the time the enamel organ is being developed or at some stage of its calcification. An eruptive fever or other febrile disturbance could easily interrupt the nutritive supply and arrest the development during the presence of the fever; but growth will be resumed as

soon as the normal relation of the circulation is established. The enamel being the only calcified tissue incapable of regenerative change, and being developed from epithelial tissue, it is reasonable to conclude that an acute disease seriously affecting the skin or mucous membrane could at the same time give rise to the changes and pathological condition referred to in the enamel organ.

Further proof of this theory is evidenced by the history of the cases that I have studied, inasmuch as all of the teeth which have reached a certain stage of development show an absence of enamel to the same extent and position on the crown, and the general disturbance through some form of fever has been traced back and found to correspond to the date of enamel development in the affected teeth.

Dr. BAKER. I just want to make one remark. These gentlemen, in speaking of replanting teeth, telling of their successes, give us no average at all. Now, if these gentlemen would tell us how many of the teeth they have replanted or transplanted have failed, we would like to hear with regard to those too.

Dr. T. L. JAMES. I have replanted but one, and that was a success.

Dr. BAKER. I have replanted but two, and those were failures.

Dr. SHRIVER. I think I replanted one, and the next time I saw the patient it was out.

(To be continued.)

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EDITORIAL DEPARTMENT.

SHOTGUN THERAPEUTICS.

A CONTRIBUTOR to a recent issue of one of our esteemed contemporaries indulges in some critical observations upon an article in a previous issue of the same publication, expressing interest therein "because it simply shows how little some men engaged in the practice of dentistry know about the pathological condition of the teeth which daily come before them for treatment." After indulging in certain reflections upon the inefficiency of the graduates of so-called "prominent colleges in good standing," and after having his humorous little fling at the teacher by stating that "the chair of pathology sometimes makes a heavier impression on the rostrum than it does upon the mind of the student," the critic comes right down to the heart of the matter by observing that "What we all want to be able to do is first to be able to recognize the troubles which come before us, and when we do, we should be able to make a correct diagnosis; then a treatment will suggest itself to fit each case and there need be no guesswork about it." Just so! That way, however, of putting the proposition has, we confess, been somewhat confusing to us, for the reason that "recognizing the trouble" and "making a diagnosis" of it we always supposed to be pretty much the same thing. Probably in the author's mind there is a difference, but as we view it the case is analogous to that of a certain advocate of compulsory religion in an institution presided over by the late Bishop Thirlwall, who, when the said advocate urged that it resolved itself simply into a question of compulsory religion or no religion, replied, "My friend,

your distinction is entirely too subtle for my mental grasp." But, admitting that we have been able to make our diagnosis, we don't feel at all comfortable about our friend's assurance that "a treatment will suggest itself to fit each case," if the mode of treating putrescent pulp-canals which he offers us be a fair sample of the self-suggested treatments which beneficently materialize themselves after the diagnosis has been made.

Where there is soreness and pus he treats as follows: "Tincture of iodine is used freely in the cavity and root-canal. Then use as a cleansing agent pyrozone. After washing thoroughly with this, sterilize the cavity with either sodium dioxid or ordinary hydrate of soda . . . , then wash out with alcohol, remove the alcohol with chloroform, and fill with chloro-percha." But why stop at that point? There are other germicides, disinfectants, sterilizers, bleachers, sedatives, coagulants and non-coagulants that might be used if needful. Why not empty the whole dental materia medica into the canal and be done with it for sure and certain? The operator could then have the comfortable assurance that something or another out of the combination would hit the mark and bring peace and comfort to his patient and contentment and a fee to himself.

In all seriousness, we have not seen for some time a better illustration of the need for systematic college training than the practical suggestions and critical reflections upon that training which the author furnishes in the article he has himself written. His mode of procedure in the treatment of putrescent canals shows either a lack of knowledge of pathology and therapeutics or a lack of faith in the medicaments he recommends to produce the results he desires to attain. It is a pretty well established fact, if the experience of dental practitioners as reported in our literature counts for anything, that any one of the medicaments proposed, with the possible exception of chloroform and alcohol, would be amply sufficient, if intelligently used, to meet the conditions of effective disinfection of the canal with complete aseptic result. Even alcohol and chloroform have been found sufficient in many cases to accomplish the same end. Therefore, what excuse can there be for a mode of treatment which involves the use of three or more powerful antiseptics?

We are inclined to the belief that the average graduate of a reputable dental college of to-day knows better, and we are practically certain that the incumbents of the chairs of pathology in our dental colleges not only know better, but are in nowise responsible for such bald empiricism masquerading as rational therapeutics as is evinced in the shotgun mode of treatment which our author recommends. Iodin for the soreness, pyrozone to cleanse, and sodium dioxid to sterilize;—well, the poor old sodium dioxid must have a bootless sort of a job in its hunt for germs after iodine and pyrozone have had the field. It is fishing behind the net with a vengeance so far as the dioxid is concerned.

We are once more tempted to write an essay on dental education,

with this shotgun treatment of putrescent root-canals as a text, for as we look at it from the point of view of that method the field seems indeed white for the harvest, and we see in the incident the justification for all the effort that is being made to impress upon the minds of dental students the basal facts of chemistry, bacteriology, physiology, pathology, and all of the data of biology which now form a part of the standard dental curriculum. And more still do we see the necessity of so training men in these branches that they shall be available instruments in their mental outfit, instruments that may be practically utilized in the treatment of disease as the dentist is called upon to treat disease,—not intellectual ornaments, or work to be done in order to get a degree. If we are not ready to equip ourselves to treat pathological conditions of the mouth in the light of a scientific knowledge of their causes, then let us drop the degree which we now wear with a just pride, and consistently admit that we are artisans only.

Scientific investigation is constantly throwing new light on the causes of disease and clarifying our conceptions of its meaning. What our ancestors regarded as the punitive act of an offended or wrathful deity we now comprehend as a reaction of the organism toward an altered environment, which is to be corrected by restoration of normal conditions. Empiricism in therapeutics is a reversion toward antiquity, based in ignorance if not in superstition, and must vanish just in proportion as the etiology and meaning of disease is understood.

But, again quoting our author, "Criticism is easy, and there is no end to it." True indeed—if criticism be only the fault-finding of the ignorant! And when the critic furnishes a magnificent example of that lack of knowledge and sound training which is the object of his critical observation upon others, it were better ended before it was begun.

BIBLIOGRAPHICAL.

PROCEEDINGS OF THE THIRD INTERNATIONAL DENTAL CONGRESS, PARIS, 1900. Published by the Secretary-general, Dr. E. SAUVEZ, with the collaboration of Dr. ED. PAPOT, and by the Committee of Publication. Volume III: Meetings of the Sections. With 1 plate and 36 other illustrations. Paris: *l'Odontologie*, 45 Rue de la Tour-d'Auvergne, 1902.

In this volume have been included contributions bearing upon subjects of vital

importance to dentists. The majority of these papers have appeared in this journal in connection with the publication in English of the proceedings of the Third International Dental Congress, and therefore any extended reference to them would imply a repetition of facts with which our readers are already acquainted.

The Committee of Publication, owing to the length of the discussions, has not been able to include in this volume all

the matter originally assigned to it, and will issue shortly a fourth volume, which will complete the series.

A MANUAL OF DENTAL METALLURGY.

BY ERNEST A. SMITH, Associate of the Royal School of Mines, London; Fellow of the Chemical Society, etc. Second Edition. Philadelphia: P. Blakiston's Son & Co.

In this carefully prepared book the author presents in a clear and concise style a condensed account of the physical properties of the metals and their chief alloys, whilst in his preface he very properly states that the mere reading of text-books will never convey to the student the precise knowledge obtainable by actual laboratory manipulations. The subject-matter is divided into twenty-one chapters, embracing 287 pages, careful perusal of which has convinced us that the author has well succeeded in presenting in a most attractive form the subjects therein discussed. As an instance of this we will refer to the chapter on Dental Amalgams, to which he de-

votes twenty-six pages, treating the subject in all its different phases and taking due account of the investigations of those well-known dental authorities who have done so much toward elucidating this important question, together with its bearing upon the actual practice of operative dentistry. The other chapters are in harmony with that just mentioned, and the work as a whole is one which will without doubt prove of value to students as an adjunct to laboratory work in this branch, and as a reference work for practitioners of dentistry.

BOOKS RECEIVED.

WE have also received the following publications, reviews of which are unavoidably laid over:

Mycology of the Mouth: a Text-book of Oral Bacteria. By Kenneth W. Goadby, L.R.C.P., M.R.C.S., L.D.S., etc. London: Longmans, Green & Co. 1903.

Success in Dental Practice. By C. N. Johnson, M.A., L.D.S., D.D.S., etc. Philadelphia and London: J. B. Lippincott Company. 1903.

OBITUARY.

DR. SAMUEL GRANT GROVE.

DIED, February 22, 1903, at St. Luke's Hospital, Cedar Rapids, Iowa, Dr. SAMUEL GRANT GROVE, from burns received in the Clifton Hotel fire in that city on the morning of February 20, 1903.

Samuel Grant Grove was born near Chambersburg, Pa., April 2, 1868. He went west to Sterling, Ill., in 1889, and in 1893 began the study of dentistry in the office of his brother, Dr. W. A. Grove, at Tipton, Iowa. Following this preliminary training he entered the Northwestern School, Chicago, Ill., from which he was graduated June 11, 1896,

and began the study of his profession in Cedar Rapids, Iowa. He was kindhearted, genial, and popular, and his abilities won for him a large and select practice.

Dr. Grove united with the First Christian Church of Sterling, Ill. He was a member of the Iowa State Dental Society and of the Northern Iowa Dental Society, a charter member of the Cedar Rapids Dental Society, and was also a member of the Masonic and Eastern Star orders.

His three brothers and three sisters survive him, and, together with his host of friends, deeply mourn his untimely death.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Dental Record*, London, April 1903.]

TWO CASES OF IMMEDIATE TORSION.

BY J. H. GIBBS.

The first case reported by Mr. Gibbs was that of a child, aged eight, in whom the misplaced central incisors were carried to their normal position by the process of immediate regulation. The patient was put under the influence of nitrous oxid and ether, and by means of a pair of straight broad-beaked forceps, with the edges of the blades protected by heavy tin foil wrapped round them, the centrals were rotated into position. Incidentally the author says that the erupting right lateral incisor was extracted, but, as he omits to state on what account such an operation was performed, it is reasonable to presume that it was done in order to obtain the space necessary for the rotation process.

Whatever might have been the purpose in view, we consider the extraction of a sound permanent lateral incisor a totally unwarranted operation, inasmuch as the absence from the arch of such an important tooth completely destroys the characteristically human appearance, and further, because we cannot conceive of any dental irregularity which would require for its correction the extraction of a lateral incisor.

The second case was very similar to the former, and consisted in the rotation into position of the central incisors of a girl aged seven.

[*New York Medical Journal*, April 18, 1903.]

A CASE OF SALIVARY FISTULA. BY

A. N. ZIMINE.

The author reports, in *Chirurgia* for February 1903, a case of salivary fistula in which he resorted to the use of the thermo-cautery to effect the obliteration of the duct, and thus the atrophy of the gland itself. The patient was a young woman, aged nineteen years, who showed the presence of a small ulcer situated at the anterior border of the masseter muscle. This ulcer partially healed after a time, leaving a small opening through which saliva was discharged in drops. At first the Paquelin cautery was repeatedly applied to this opening, with the effect of arresting the discharge for a few days. A radical operation was then performed, con-

sisting of freshening the edges of the opening by means of an oval incision cutting through the entire thickness of the cheek, within this oval passing a gauze drain into the mouth, and suturing the denuded edges of the fistula. In other words, an attempt was made to convert an external fistula into an internal. After three days the wound separated, the sutures had to be removed, and the drain taken out. A second operation consisted in burning a passage through the cheek by means of the Paquelin cautery and introducing a rubber drainage-tube, from 3 to 4 mm. in diameter, into the opening thus made. On the eleventh day the tube was removed and an ointment of silver nitrate was applied to the granulating surface of the fistula.

Healing took place gradually, and in about four weeks the discharge of saliva ceased. Finally, a firm scar was obtained on the outer surface of the cheek.

[*Oesterreichische Zeitschrift für Stomatologie*, Vienna, April 1903.]

REPEATED LUXATIONS OF THE MANDIBLE. BY PROF. PARTSCH.

The author reported before the medical section of the Schlesischen Gesellschaft the case of a man aged thirty-eight, whose mandible became dislocated during the course of an operation for the extraction of teeth. After the occurrence of the accident, every time the patient attempted to open the mouth the mandible became displaced, and as the prognathous condition of the mandible increased the tendency to dislocation, the author devised an appliance to support the mandible. This was adapted to the chin and was of great help in eradicating the disturbance.

[*Lancet*, London, April 25, 1903.]

NOTE ON A CASE OF NASAL CALCULUS WEIGHING FORTY-EIGHT GRAINS. BY A. J. HELM MONTAGUE AND RICHARD LAKE.

A woman aged thirty-six years complained of an offensive discharge from the left nostril, a disagreeable taste in the mouth, and inability to breathe through the nose. The above symptoms had existed for five years. On examination a large calculus was found firmly imbedded in the left nasal cavity. The

author removed it with forceps under cocain. The calculus weighed forty-eight grains. The outer crust consisted of earthy carbonates and phosphates and the nucleus consisted of a cherry-stone, which, when crushed, revealed the kernel intact. Nineteen days after the operation all symptoms had disappeared and she was able to breathe normally through the nose.

It is probable that when a small child the stone was pushed into her nostril by one of her playmates or by herself, and it is of interest to note that the patient had no idea of its presence and that the conditions remained quiescent for so many years.

[*New York Medical Journal*, April 11, 1903.]

THE SIXTH-YEAR MOLAR TOOTH. (EDITORIAL.)

The editor of this publication calls the attention of the medical practitioners to the importance of preserving the first molar, and advises them to take pains to inform themselves on certain points with which they may readily make themselves quite competent to deal, as it is not always practical for patients to consult a dentist. He quotes from the interesting communication by Dr. Mahé, published in the *Presse Médicale*, for the especial benefit of physicians. In this Dr. Mahé gives them directions for distinguishing this tooth, with the indications as to whether or not it should be extracted in cases in which it may be attacked with caries.

[*International Dental Journal*, April 1903.]

SOME OF THE CAUSES OF IRREGULAR TEETH, WITH SUGGESTIONS AS TO PREVENTIVE TREATMENT OR EARLY CURE. BY E. A. BOGUE, D.D.S., NEW YORK.

The author discusses the relations of the first molars, saying that if these teeth come into normal position at their eruption, we may be certain that there will be no serious irregularity back of the canine teeth, but when from any cause these two principal molars erupt out of line with each other, irregularity of some sort is absolutely certain. The author calls attention to the necessity of replacing the first permanent molars in their proper positions and relations to each other should they be found developing out of place at five and a half to seven years of age, as at this tender age this deformity can be easily corrected. Dr. Bogue shows by means of carefully prepared models the irregularities produced in the space of ten months in the mouth of a child aged six by

the presence of adenoid growths obstructing the air-passages, and explains fully the changes which eventually resulted in the production of a most serious deformity.

[*Dental Review*, Chicago, April 15, 1903.]

TEMPORARY AND PERMANENT FILLINGS AS BARRIERS TO BACTERIA. BY A. E. WEBSTER, TORONTO, CAN.

The author has carried on a series of investigations to determine the degree of efficiency of temporary and permanent filling materials as barriers to bacteria. From this work he has been able to draw some interesting conclusions,—namely, that gutta-percha, temporary stopping, cement, cotton and sandarac, cotton, vaselin and cement, or gutta-percha, are of no value for sealing a cavity in a tooth to prevent infection from the oral cavity. As a result of his researches he feels safe in stating that zinc oxyphosphate cements, gutta-percha, cotton, or any combination of these with each other or with any other non-disinfecting materials will not prevent the passage of moisture or bacteria. Zinc oxychlorid will prevent the passage of bacteria for at least sixty days, but not of moisture for that length of time. Some amalgams, if properly mixed and inserted, will resist the passage of bacteria for two months, while others, no matter how mixed or inserted, will not resist them for three hours.

Regarding cements, Dr. Webster states that he has tested ten or twelve cements of different names, and that his conclusion is that they all leak. Those that do not shrink allow the passage of moisture and bacteria through the mass, the only difference being that those that shrink leak sooner than those that do not. He has tested only a few amalgams, and has reached the conclusion that those that contract or flow badly are quite likely the only ones that leak. Root-canal fillings made by heating gutta-percha cones and packing them with instruments that penetrate the material are not so resistant to either moisture or bacteria as those made by first using chloro-percha and then carefully forcing the proper sized cone into the canal without puncturing or heating. When gutta-percha is heated it seems to acquire a tendency to creep, and, unless it is held with continuous pressure until it is hard, spaces will appear around it. Notwithstanding its defects, chloro-percha root-fillings are the best resistants to moisture among those materials examined, but this resistance is not great enough to make it an ideal filling.

His final conclusion is that few, if any, root-canal fillings are resistant to either moisture or bacteria, and that most periodontal infections are direct from the oral cavity in pulpless teeth, and were zinc oxychlorid used in the pulp-chamber or some part of the root-canal, many if not all such infections would be averted.

[*l'Odontologie*, Paris, February 28, 1903.]

PLANTATION OF TEETH. BY GUSTAVE ELLER VAINICHER, NAPLES.

After reviewing the history of the operation of planting teeth, first mentioned in the writings of Abulcassis in the eleventh century, the author fully describes the experiments which he has carried out with the view of determining the conditions in which any one of the three operations of replantation, transplantation, and implantation would be indicated, as well as the nature of the attachment between tooth and alveolus and the duration of the operation. With these purposes in view he performed several operations upon dogs. In one case a tooth was replanted immediately after its extraction, and, after a lapse of two months, the investigator resected the region of the maxilla in which it was located in order to carry out a histological examination. It was then found that the entire cement covering of the root had disappeared, and that the dentin presented areas of absorption. The pulp was very vascular and showed that it had been the seat of active cellular proliferation. The bottom of the alveolus seems to be filled with embryonal cells which become decidedly fibrous as they approach the apex of the root. Within this cellular mass is located the vascular network from which arise the apical branches which penetrate the tooth, ending in the odontoblastic layer. The periosteum had been likewise the seat of active cellular proliferation, presenting a thickness more than twice the normal. From this histological examination the author concludes that in this particular case the pulp became grafted to the tissues at the bottom of the alveolus, a union similar in nature to that which takes place between the borders of a wound.

The results of the other two cases of replantation were not successful, inasmuch as the tooth was exfoliated after two months in one case and after four in the other. He then describes his observations in a case of transplantation, stating that the histological examination revealed the fact that the pulp had undergone complete atrophy.

The author then discusses the implantation operation, referring to the works of Younger, Amoëdo, and Znamensky, and describes three cases of unsuccessful implantation. After presenting several statistical data on transplantation and implantation, he closes his communication with the following conclusions: A replanted tooth can remain alive and can become attached to the surrounding living tissues. In the case of the replanted tooth all the surfaces of the root are in close adaptation to the alveolar walls, and because of this favorable arrangement circulation is re-established, as is the case in tissue healing by first intention. The periosteum of teeth to be replanted should not be disturbed, and this operation should be performed only as a *suprema vis remedii*.

The operations of transplantation and implantation should be excluded from dental practice.

[*British Journal of Dental Science*, London, April 15, 1903.]

DIAGNOSIS OF TOOTHACHE, AND FACIAL NEURALGIA OF THE DENTAL REGION. BY MR. HENRY SEWILL.

The most frequent seat of neuralgia is the region supplied by the fifth nerve; the most common cause of this affection is to be found in abnormal or pathological conditions of the teeth. Neuralgia, due to dental disease, may occur in paroxysms with intervals of complete freedom. It may be periodic, and there are no symptoms which serve to differentiate neuralgia due to local from that due to constitutional causes. Besides diseases of the teeth, other disorders may give rise to neuralgia. The nerve or any of its branches may be compressed by a tumor, may be affected by exostosis, or by necrosis of the bony canals through which they pass. The author calls attention to the fact that tumors of the antrum may cause neuralgic pain, and that inflammation and empyema of the antrum are often attended by severe neuralgia and toothache. Pain from nodes in the skull is often neuralgic in character. Sometimes neuralgia occurs without the apparent existence of any lesion, and in such cases the essayist believes the disease to be due to pathological changes in the nerve centers, nerve ganglia, or great trunks. He then refers to the relationship between the fifth nerve and not only the cranial but also the visual regions, and how irritation in any region may be reflected upon the fifth nerve, producing the so-called reflex or sympathetic neuralgia.

He then calls attention to the different pathological conditions of the teeth which may give rise to neuralgia, stating that among these conditions inflammation of the pulp is the most frequent one. He likewise refers to the well-known fact that teeth that are not the seat of appreciable pain are sometimes the cause of distant neuralgia, as, for instance, the earache caused by disturbances of the second or third molars. In every case of pain in the ear, he says, where no other cause is readily discoverable, the teeth should be examined. He also says that true facial neuralgia not associated with dental disease is commonly accompanied by violent toothache, and that in such cases patients not infrequently undergo extractions of many sound teeth without relief.

He then carefully discusses the symptoms of tic douloureux, and takes up the treatment of neuralgia, advising the careful examination of each tooth by means of appropriate instruments. Impacted lower third molars may be the cause of neuralgia, either from caries or inflammation. This can be explained on the supposition that the root of the tooth in some way presses upon, or interferes with, the inferior maxillary division of the trifacial. Pericementitis is also given as a cause for neuralgia; also badly fitting artificial teeth, from their pressing upon the gums or causing erosion of the tooth-substances.

The author describes certain cases of neuralgia which have not been described before, namely, the production of neuralgia by change in the structures of the temporo-maxillary articulation incident to the loss of teeth, the pain being due, as he considers, to irritation of the articular branches of the fifth nerve, due to the change in the arrangement of the structures forming the articulation. These cases bear a resemblance, in their intensity and resistance to ordinary methods of treatment, to true tic douloureux, for the relief of which serious surgical interference, even the removal of the Gasserian ganglion, is resorted to.

He concludes his interesting communication by stating that neuralgia in young persons is in the vast majority of cases due to dental diseases or to other local irritation, and that neuralgia of other regions, also tic douloureux, are extremely rare before middle age. Neuralgic pain about the bone and around the orbit is often caused by dental disease; lower molars in the former, and upper incisors and canines in the latter, being commonly the teeth at fault. Neuralgic pain due to dental disease is usually, although by no

means invariably, superficial, lancinating, or burning in character, and follows the course of nerve branches through the skin.

[*Dental Record*, London, April 1903.]

X-RAYS IN THE TREATMENT OF PYORRHEA ALVEOLARIS. BY WILLIAM GUY.

The author has used the X-rays in conjunction with the routine treatment of pyorrhea alveolaris with sufficiently encouraging results, and reports a case thus treated in which the lower incisors, canines, and bicuspids were very loose, the gum unhealthy, spongy, and livid, and almost purpuric in appearance, pus freely escaping from around the necks of the teeth. The lower teeth were highly hypersensitive to thermal stimuli, and on this account the patient was unable to use them. The teeth were scaled and cleaned carefully, and were then exposed to the influence of the X-rays upon alternate days. The exposures were not pushed to the production of reaction; a sheet tin mask with suitable openings was used, and the patient, in using his hands to hold it incautiously exposed them and suffered a pretty severe dermatitis. From the first exposure improvement in the state of the gums was evident, and after each exposure the teeth were less sensitive to hot and cold liquids. He has had twenty-one exposures, and his mouth is now, according to his own opinion, in a more comfortable state than it has been for years. The lower teeth are firm, very little pus can be expressed, and the gums are hard, firm, and healthy. This case was one of such severe intensity that it did not look as though anything could do much good. The author makes no claim for the X-rays, but merely suggests their use in view of the successful results obtained in the case just described.

[*Lancet*, London, April 25, 1903.]

THE ACTION ON BACTERIA OF ELECTRICAL CURRENTS OF HIGH POTENTIAL AND RAPID FREQUENCY. BY DRS. A. G. R. FOULERTON AND A. M. KELLAS, LONDON.

The authors refer to their previous investigations, in which they showed that by discharging a current close to the surface of a fluid containing bacteria and held in a test-tube to the bottom of which a platinum wire had been sealed, it was possible to destroy the organisms suspended in the fluid. The organisms tested in this way were the bacillus typhosus, bacillus coli communis, bacillus dysenteriae (Flexner), bacillus anthracis, bacil-

lus pyocyaneus, *bacillus prodigiosus*, *staphylococcus pyogenes aureus*, and *streptococcus pyogenes*. The current used was one of from two-fifths of an ampere to 5 amperes, the voltage varied from 35 down to 24, and the experiments were carried out in an atmosphere of common air. Sterilization of the bacterial emulsion occurred after exposures of from ten to twenty minutes' duration, varying apparently with the intensity of the current employed. Further experiments have been carried out by the authors to determine the precise cause of the sterilization. It has been found that if the experiments are made in an atmosphere of hydrogen instead of in common air, the bacteria will survive exposure to discharges of at least one and one-half hours, beyond which time the experiments have not been extended.

They also found that when the current was discharged over the surface of water in an atmosphere of common air there was a rapid development of acidity in the fluid due to the formation of nitrous and nitric acids from nitrogen dioxid formed by the discharge of the current in the air. The nitrous acid was, under the conditions of the experiments, rapidly changed to nitric acid, and it was to the latter that the germicidal action must be mainly attributed.

As a result of their experiments the authors state that the useful discharge of the electric current may be partly due to the germicidal action of chemical decomposition products formed in the air.

[*Deutsche Monatsschrift für Zahnheilkunde*, Leipzig, April 1903.]

DIFFICULT ERUPTION OF THE PERMANENT TEETH. BY DR. F. SCHILLING.

The purpose of this report is to show that difficult eruption of teeth is not limited exclusively to the deciduous organs, but that it likewise occurs in conjunction with the eruption of the permanent ones. The reviewer cannot fail to recall Professor Truman's interesting observations upon this subject, particularly in relation to the reflex disturbances incident to the descent of the lower second molar from the ramus of the jaw, where it is carried by virtue of the direction in which mandibular development takes place.

The author reports the case of his little daughter aged twelve, in whom the eruption of the upper right permanent canine gave rise to a series of serious phenomena. The child was taken ill with fever accompanied by delirium, the cheek became swollen, the

tumefaction extending to the right lower lid, and a profuse amount of mucus exuded from the nose. The feverish state lasted about five days, and the swelling, while it decreased considerably, did not disappear entirely until after the twelfth day. The author believes that the cause of these disturbances must be sought in the inharmonious development of the root and crown, the process being more marked upon the former. It is also reasonable to suppose that the inflammation of the nasal mucous membrane was due primarily to congestive phenomena about the muco-periosteum of the antrum, the inflammation extending eventually to the nose through the opening between the middle meatus and the maxillary sinus. Three weeks after the subsidence of the first swelling a secondary one appeared which lasted three days, at which time the cusp of the canine made its eruption through the gum.

[*Wiener Zahnärztliche Monatsschrift*, January 1903.]

PAINFUL ELECTRICAL PHENOMENA IN TEETH FILLED WITH GOLD. BY DR. FRANZ TRAUNER.

The author states that the production of painful electrical phenomena in teeth filled with gold or other metallic filling materials is not an extremely rare occurrence. He recalls a particular case in which the contact of a tooth filled with gold with several teeth in which amalgam fillings were present, or with the metal framework of a plate, or with tin-covered candy, was accompanied by painful sensations. Dr. Trauner incidentally reminds his readers of the well-known fact that the contact between two dry and non-oxidized surfaces produces electric currents of such weak intensity and short duration that their presence is hardly detectable, but if the two metallic surfaces come in contact in the presence of liquids, currents of appreciable intensity are produced. In this way can be explained the painful sensation experienced by patients when metallic instruments are brought in contact with amalgam fillings after the rubber dam has been removed and saliva is allowed to enter the mouth. In cases of this nature the electrical sensation becomes apparent only after the entrance of the saliva, and with a delicate galvanometer it is possible to detect currents of three-tenths of a milliamper, and even more. It is interesting to note that the piercing pain is also felt in devitalized teeth. During the process of filling with cohesive gold painful phenomena of similar nature are

sometimes produced, these phenomena being caused by the overheating of the superficial layer of gold incident to continuous hammering, a condition which is responsible for the production of thermo-electric currents. He fully explains the phenomena concerned in the production of these electric currents, and

suggests three methods by which they may be prevented. These consist mainly in allowing the escape of the electrical energy accumulated in the patient by grounding the current or by connecting it with the iron framework of the chair.

PERISCOPE.

Receding Gums.—Apply glycerite of tannin to spongy gums as a tonic astringent lotion. It re-establishes the nutritive function.—*Dental Register*.

Adrenalin and Cocain.—Dr. Hermann Mynter says that he has used adrenalin in combination with cocain, in order to prevent hemorrhage during the performance of small operations.—*Medical News*.

Washing Soda (Sodium Carbonate) Injurious to Aluminum Instruments.—The ordinary washing-soda solution in which instruments are boiled will entirely ruin aluminum instruments, and hence should not be used for sterilizing them.—*Internat. Journ. of Surgery*.

Guaiacol to Relieve Pain.—Dr. B. H. Bodnax (*Medical Summary*) states that guaiacol is a valuable agent for the immediate relief of pain. He cites cases in which it has cured headache and earache, and adds that a few drops rubbed gently over the seat of the pain will stop it immediately.

Sterilization of Instruments.—A writer in the *Revista Médica de Sevilla* states that the formula here given, while very active in so far as microbic destruction is concerned, does not injure the temper, polish, or cutting qualities of steel instruments. The formula is as follows: Mercuric oxycyanid 40 gm.; thymic acid 4 gm.; potassium or sodium chromate 1 gm. Dissolve in twenty liters of water.

A Point About Ether Anesthesia.—A point of great importance in ether anesthesia is to remember that after its administration the patient has all his bloodvessels dilated and has lost heat largely, so that the administration, especially if at all prolonged, should take place in a warmed room, and every precaution against catching cold should be taken.—B. WHEWELL HOGARTH, *British Dental Journal*.

Treatment of Shock.—The hypodermic injection of brandy, whiskey, or sulfuric ether is one of the best methods of combating intense shock and collapse, but the surgeon should always remember to inject them deep into the muscles, as they may cause sloughing of the skin if injected immediately beneath it, and they should not be introduced in the neighborhood of any important nerve, as they have been known to cause paralysis or neuritis.—*Internat. Journ. of Surgery*.

Morbid Growths of the Maxillary Sinuses.—At the late meeting of the American Laryngological, Rhinological, and Otological Society (*American Medicine*, March 15, 1902) Dr. Robert C. Myles reported four cases of polypi attached to the upper wall of the maxillary sinus and protruding into the nose and rhino-pharynx. In each instance relief was obtained by curetting the sinus, and, so far as has been ascertained, there has been no recurrence.—*Amer. Journ. of the Med. Sciences*.

Choice of an Anesthetic.—In a paper on the above subject read at the County Medical Society on March 25th, Dr. G. G. Davis said that the choice depends largely on custom and environment, but the surgeon should avoid the routine use of any one anesthetic. Dr. Davis at one time felt that ether was the anesthetic to choose, unless there was a distinct indication for chloroform, but was afterward convinced by certain cases, two of which he detailed, that ether can and does kill, hence cannot be regarded as absolutely safe. Ether should be used where shock is liable to be a complication. Nitrous oxid before ether is a valuable adjunct if rightly used. Closed etherization should never be employed except by those who are expert in the use of that method. Ethyl bromid is not to be recommended. In closing Dr. Davis called attention to the value of primary anesthesia in minor operations.—*Medical News*.

Adrenalin Chlorid.—As a hemostatic I have found adrenalin chlorid to act finely when applied thus: Saturate a pledget of cotton with the solution, place over surface to be affected, press nozzle of chip-blower firmly against the cotton, and force air through a few times. Cocain may be forced into tooth or soft tissues very readily in the same way. This may not be new, though I have not read it or heard it suggested. Anyway, if all do not know of it, it is worth while that it be mentioned.—S. PRESTON, Bramwell, W. Va.

Absence of Salt as a Cause of Stomatitis.—Dr. J. C. J. Bierens de Haan (*Deutsche med. Woch't*) describes an epidemic of ulcerative stomatitis that broke out simultaneously with a great shortage of salt among the troops in South Africa and those who came in contact with them. There were no constitutional symptoms, and the trouble rapidly subsided when the supply of salt was restored. Mild antiseptics and astringents proved useful therapeutic measures.—*New York Med. Journal*.

Cerebro-Spinal Fluid as Excipient for Cocain in Subarachnoid Injections.—Dr. A. Guinard of Paris reported at the Fourteenth Congress of the French Surgical Association, held in Paris in October last, that he attributed the headache, high fever, and other disagreeable symptoms to the water used in making the cocain solution. He avoids these disagreeable effects by employing the patient's own cerebro-spinal fluid as the vehicle for the solution. He describes his procedure in detail, and is able to report fifty successful operations by this method without a single disagreeable after-effect.—*Squibb's Ephemeris*.

Treatment of Buccal Manifestations of Syphilis.—Mucous patches in the mouth, on tongue, lips, palate, tonsils, or pharynx are best controlled by strict cleanliness of the mouth and the application of a 5 per cent. solution of silver nitrate every other day, and the use of a gargle containing mercury such as—

R—Hydrarg, bichlorid, gr. iiij;
Tinct. myrrh, 3ss;
Aq. dest., q. s. ad 3viij. M.
Sig.—Gargle.

or,

R—Alum, 3j;
Chlor. potass., 3jss;
Aq. dest., 3viij. M.
Sig.—Gargle.

—W. D. TRENWITH, *Med. News*.

Lysol.—Lysol (the saponified product of coal tar, chiefly composed of cresols), the substitute offered for carbolic acid, does not seem to be any more of a favorite than last year. Unfortunately the poisoning cases have accumulated somewhat. Dr. Georg Burgl of Nuremberg, Bavaria, relates two cases in each of which the drug has been taken by a child by mistake. He also enumerates eighteen cases of intoxication on record in the literature of the year. (*Muench. med. Woch'en'ft*, vol. xlviii, p. 1524.)—*Squibb's Ephemeris*.

Abscess a Sequela to the Use of Mummifying Pastes.—I have found that in nearly all cases where the mummifying process has been used there has been an abscess. I have used it very sparingly, depending more upon the thorough root-canal cleaning. However, there are a great many canals that I do not believe any man can reach. I have worked as persistently as anybody in some of these cases, and I find there are some canals which it is impossible to clean out thoroughly, and in these canals only do I use the mummifying paste.—N. B. STANZA, *Dental Era*.

To Prevent Melotte's Metal from Becoming Brittle.—If whiting (calcium carbonate) be used as a separating material in making dies and counter dies with Melotte's metal, it should be thoroughly removed before the metal is remelted. The heat in fusing breaks up the carbonate radical of the whiting, and lime (calcium oxid) is formed, which, if incorporated in the alloy, makes it brittle. The lime can be chemically and easily removed by dipping the ingot in dilute hydrochlorid acid (ten per cent.). This will convert the lime into soluble calcium chlorid and the soluble salt can be thoroughly washed off with water.—J. P. BUCKLEY, *Dental Review*.

Retention of Porcelain Inlays.—The finished inlay should fit the cavity so closely that only the thinnest layer of cement is present after the inlay is inserted. The retention is best effected by simply etching the cavital surface of the inlay with concentrated hydrofluoric acid. To do this place the inlay face down on a piece of paraffin or wax, and with a warm spatula draw to the edges, cool, and apply acid with a hard rubber point for a minute or two. After the inlay has been inserted scrape away excess cement and varnish with sandarac. Then apply paraffin, which will adhere for a much longer time to the sandarac than to the surface of inlay or tooth.—T. VICTOR SMITH, *Internat. Dental Journal*.

Burnishing of Platinum Matrices.—In burnishing the matrix it is well to anneal the platinum several times to keep it as soft as possible. Place it over the cavity orifice and outline the edges, then with a ball burnisher gradually draw from the edge to the center. When well into the cavity a piece of spunk is placed at the cervical portion and thrust home, another piece added, and so on, until the entire cavity is full, thereby swaging closely to all walls and angles. An instrument can then be held on the spunk and another used by the operator to burnish the edges more carefully. The spunk is then removed piece by piece in advance of the matrix.—T. VICTOR SMITH, *Internat. Dental Journal*.

The Importance of Proper Preliminary Education.—The history of medicine proves that the position of every profession depends upon the proper selection of its material quite as much as upon the preparation of that material, if not more so; and this because of the fact that success in teaching depends so largely upon the co-operation of those taught. The province of professional teaching is the development of professional capacity, this being as much as the term of study will permit. But the individual character is inseparable from the professional, and so constantly modifies it that a certain degree of education thereof is indispensable as a foundation upon which to build.—*Amer. Journ. of Dental Science*.

Constituents of Coca-leaves.—Hesse (*Journ. f. Prakt. Chemie*, 66, 401) has examined the leaves of the coca obtained from Java, and has extracted four definite compounds from them which are not alkaloids. These bodies are—(1) Cocacitrin, $C_{23}H_{32}O_{17}$, a yellow crystalline compound with three molecules of water, melting at 186° . It appears to be a glucosid, yielding a sugar, cocoaose, $C_6H_{12}O_6$, which may be identical with dextrotalose, since its osazone melts at 180° C. (2) Cocacetin, $C_{16}H_{12}O_7$, forming yellow needles with three molecules of water of crystallization. It melts at 260° - 265° . (3) Cocaflavin, $C_{34}H_{38}O_{19}$, forms yellow crystals with four molecules of water. It yields dextrose and galactose on hydrolysis with dilute sulfuric acid, and is therefore probably a glucosid. (4) Cocoflavetin $C_{20}H_{12}O_7(OCH_3)_2$, forms green-yellow needles with three molecules of water. It melts at 230° . It contains two meth-oxy groups, but otherwise its constitution is unknown.—*Chemist and Druggist*.

Antiseptic Power of Metals, especially of Gold and Platinum.—A graduate of Johns Hopkins, a bacteriologist, made some experiments with reference to the growth of different kinds of bacteria on or about different metals, using small disks of metal about the size of a five-dollar gold piece. These he placed in properly prepared and inoculated dishes, and he found that each metal had some power of keeping away the bacteria, some more than others, for there were zones of different widths around the pieces of metal. I forget all the different metals he used, but I do remember that gold and platinum were in the tests, and about them was a large zone which bacteria would not cross.—W. A. HECKARD, *Dental Review*.

Setting Crowns and Bridges.—In setting a bridge, or a banded crown, the cement which is pressed between the gum and root is sometimes difficult to remove, and in cases where a saddle is used it is almost impossible to remove the surplus cement which is forced under the saddle. Cement, if allowed to remain in contact with the soft tissues, acts as a constant irritant and should be avoided. An easy method of preventing the cement from being forced between the soft tissues and the bridge or crown while it is being pressed to position is to coat with oil all surfaces of the metal that come in contact with the gums. The oil prevents the surplus cement from adhering to the metal and causes it to be pressed out where it can be readily removed.—W. H. G. LOGAN, *Dental Review*.

How to Control the Acidity in the Mouth.—We have a great many patients from the age of fourteen years upward who suffer terribly from the ravages of caries. Most dentists cure the disease by filling all decayed teeth, but neglect to make the patient attentive to the cause, which generally is in the saliva. When I began to practice, thirteen years ago, I advised my patients to wash out their mouths very often with the solution of soda bicarbonate, and the results were pretty good. But wishing still better success, I have had some very hard lozenges (tabloids) of soda bicarbonate made, and advise my patients to put one-quarter of a lozenge (or tabloid) between the upper molar and the cheek before going to bed, changing alternately, one evening on the right, another evening on the left side of the mouth. In this way the soda bicarbonate dissolves very slowly all night and neutralizes the acid saliva.—EUGENE J. WETZEL, *Internat. Dental Journal*.

Filling Small Round Cavities with Non-Cohesive Gold.—Take a third of a sheet of No. 5 non-cohesive gold foil, folded into a very narrow ribbon, and insert one end into the cavity. With a hand plugger catch the ribbon far enough from the end just introduced to form a fold sufficiently long to reach to the bottom of the cavity, while the loop of the fold extends slightly beyond the orifice. Continue this process until the cavity is a little more than full. Then condense and finish as in any ordinary case. If the cavity be extraordinarily deep for its size, fill to say one-half its depth and condense. Use this as the floor of the cavity and proceed as above described. Non-cohesive gold spreads upon pressure and accommodates itself to the size and shape of the cavity without balling, as is the case with cohesive. Besides, such a cavity may be filled in much less time with the former than with the latter.—R. E. SPARKS, *Dominion Dental Journal*.

Conservation of Pulp-Vitality in Deciduous and Permanent Teeth.—Is it ever proper to destroy the pulp of a temporary tooth? We prefer such palliative treatment as the application of creasote on a pellet of cotton to the exposed pulp; and only where such means fail to give relief and the preservation of the tooth for a time at least is necessary in order to avoid the consequences resulting from its premature extraction, such as irregularity of the permanent teeth, etc., do we use devitalizing agents.

For some time past in our own practice we have applied carbolic acid to the exposed pulps of both permanent and temporary teeth, and have obtained satisfactory results from its use. It frequently happens in the preparation of cavities in both temporary and permanent teeth, that the decay has progressed so far that its removal necessarily exposes the pulp. In such cases as these we should endeavor to preserve the vitality of the pulp, instead of destroying it; and carbolic acid will, in the majority of cases, prove effectual in accomplishing this result.—EDIT., *Amer. Journ. of Dental Science*.

Natural Means of Alleviating Pain.—Ritter (*Archiv für klin. Chir.*) makes the announcement that he has established by his research that the pain from a serous effusion is not caused by the mechanical action of the fluid, but by its concentration. The constant destruction of albumin produces rapidly a very concentrated fluid, which causes intense pain, but as more serum mixes with it, as the dilution increases

the pain diminishes. Bier has called attention to the fact that his methods of inducing artificial hyperemia or venous congestion reduce the pain to a marked degree. Ritter shows that this alleviation of the pain is due to the dilution from the hyperemia or venous congestion in the concentrated effusion. We must assist nature in this process of dilution, and we will be able in this way to systematically alleviate pain. He has been most gratifyingly successful in the application of these principles to the treatment of severe, painful burns, inducing venous congestion according to Bier's directions.—*Journ. Amer. Med. Association*.

A Mummifying Paste.—A satisfactory mummifying paste has been produced since the advent of formaldehyd. Those who tried the alum formula were not satisfied on account of the lack of success and want of stability of the compound. Now we have a paste that keeps its consistence for an indefinite time, and the results are all that could be desired. The formula is—

Take—Paraformaldehyd,
Thymol, ... āā. 3j;
Zinc oxid, ... 3ij;
Glycerin, q. s. to make a stiff paste.

The paste should be of such a consistence that quite a large quantity will adhere to the broach when dipped into the bottle. Then it can be carried to the mouth of the canal and coaxed to place by a pumping motion. Where admissible, insert a gutta-percha spindle. I believe it to be a good practice to use the paste in all root-canals, as there may be small ramifications of pulp that we are quite unable to detect except in sections of extracted teeth. The paste makes an excellent antiseptic application when used in canals from which a putrescent pulp has been removed.—JOHN G. HARPER, *Dental Era*.

Consultation Among Dentists.—In all cases of doubtful diagnosis uncertainty respecting proper treatment, or when a fatal termination is feared, the physician avails himself of the aid and counsel of his fellow practitioner. In like manner consultation should constitute an important factor in the direction of an acceptable aid to our success. Not that our opinions or our proceedings are of such a character that they involve a question of life or death; not that we are incapable in a general way of doing the best we know how under the circumstances; but that we may, by thus deliberating, do better than we previously knew how, and having done this we should have the frankness to

admit the same. The consultation of the dentist must of necessity differ from that of the physician; it need not be a hurried consideration of symptoms and signs, followed by extreme or heroic treatment, but, instead of this, it may be a deliberate weighing of the facts; and this should be and I think is the primary function of most dental societies. It is chiefly at the meetings of these organizations that our consultations should take place. The self-sufficiency which fails to avail itself of such aid and co-operation as that furnished in the form of consultation through dental societies is justly amenable to censure.—I. NORMAN BROOMELL, *Dental Brief*.

Are Towels as They Come from the Laundry Aseptic?—First, we decided to try if the ordinary linen, as we get it from the laundry, is really aseptic. Accordingly, with a pair of scissors and a pair of pliers, both absolutely sterile, we snipped a piece out of the inner folds of a towel, and lodged it with every precaution upon some sterile glucose agar, pressing the particle gently against the surface, and replaced the sterile cotton plug in the test tube, everything having been previously sterilized except the bit of linen. Then, with the same care, we cut off a bit of fringe of the same towel. (This towel had been lying in the locker a week or more, but had not been used.) Of this we made a stab in some agar medium, pressing it with a sterile needle down to the bottom of the test tube, so that it would be away from oxygen. The two tubes were placed in the incubator and watched daily, but even at the end of the seventh day there was no sign of any growth whatever. This, we are pleased to think, goes to prove that we can depend upon our laundry really being sterile, as germs of any kind had every chance to develop if they were present.—P. E. CLARKSON, W. Y. HAYDEN, *Dominion Dental Journal*.

Statistics of Ethyl Chlorid Anesthesia.—In the last four years or so ethyl chlorid—which was first used under a misapprehension by Lotheisen of Innsbruck—has to a large extent replaced ethyl bromid. The ordinary pure ethyl chlorid, C_2H_5Cl , sometimes called by the proprietary names of Kélène, or Narcotile, is the drug used. Various forms of mask have been recommended. The earlier ones, such as Breuer's, allowed of admixture of the vapor with air; more recently, in order to avoid the excitement sometimes caused by such mixture, air has been largely excluded until narcosis is complete. In my last three

hundred cases I have used Ormsby's ether inhaler, which quite fulfills this object. I use the tubes of 60 gm., graduated, and emitting a larger spray than usual. Anesthesia occurs very rapidly, usually in from one-half to one minute—that is, more quickly than is the case with nitrous oxid. Excitement is absent. During narcosis the color is improved; the pulse, so far as I can ascertain, is about normal in quality, and the respiration is stimulated. In deep anesthesia stertor is usually present. The awakening is very rapid and complete. Seitz of Constance has recently collected 16,000 cases, with one death, that of a very bad subject.—W. J. MCCARDIE, *Treatment*.

Alopecia Areata of the Mustache of Dental Origin.—Milian (*Ann. de Derm. et de Syph.*, 1902, No. 11), at a séance of the Société Française de Dermatologie et de Syphiligraphie, reported the following interesting case of alopecia areata: A man, aged thirty-five years, who had suffered much from carious teeth, of which he had a great number, presented a patch of alopecia areata in the mustache over the upper right lateral incisor. This tooth after a severe neuralgia of both jaws had remained very sensitive, and the patch of alopecia had developed over it at the same time vesicles identical in appearance with those of herpes had appeared on the corresponding part of the gum. The hairs about the borders of the patch were easily extracted, and presented the usual appearances observed in this disease. The skin was thinned and presented a marked anesthesia. There were no other patches of alopecia. The patient was directed to have the mouth cleansed and the teeth looked after by a dentist, and was given quinin internally in moderate doses. Shortly after the jaws had been put in good condition, the sensitive incisor having been extracted, the patch of alopecia ceased to extend. Later, the neuralgia ceased, the sensibility of the skin returned, and at the end of about four months the plaque was completely covered with hair.—*Amer. Journ. of the Med. Sciences*.

The Value of Mercurial and Phenol Preparations as Disinfectants.—The comparative value of the older and newer preparations has been made the subject of bacteriological experiment by F. Hammer (*Muench. med. Woch't*, March 10, 1903). He employed pure cultures of staphylococcus pyogenes aureus and anthrax spores, with which silk threads were infected and exposed to the action of the various compounds. The

results show a greater activity of the inorganic, as compared with the organic mercurial compounds. Undoubtedly this depends on chemical combination and not on the amount of the metallic mercury. The methyl-phenols are more powerful than the benzo-phenols. It may be stated that a five per cent. carbolic solution only equals in disinfecting power a three per cent. creosol solution. In comparison with the mercurial compounds, especially sublimate, the phenols have practically no effect on anthrax spores, but on the contrary exhibit a most marked effectiveness against aureus. It is also to be noted that lysoform is by no means so effective as formalin and shows poor results in both varieties of bacteria. The author's conclusions are that different varieties of bacteria are not affected alike by any one preparation. He points out that for each group, therefore, we must select the agent which has been experimentally proved to be the most effective.—*Medical News*.

Improvement of General Anesthesia.—The improvement on the basis of Schleich's principles with special reference to "anesthol" is discussed in a most interesting paper by Willy Meyer (*Journ. Amer. Med. Association*, February 28, 1903). The effort heretofore has been directed not only to the discovery of a new and less dangerous narcotic, but also to improve the chemical conditions of the known anesthetics by making them absolutely pure. Schleich's investigations were conducted on an entirely different plan; he started to find an anesthetic of which the boiling-point would correspond to the body temperature, substituting a physical for the chemical basis, so that the amount eliminated during expiration would almost equal that absorbed during the previous inspiration. He finally devised an apparently suitable mixture of ether, chloroform, and petroleic ether (benzin). Meyer made a series of trials with this mixture, and although fairly good results were had, substituted for the petroleic ether, finally, ethyl chlorid, and called the product anesthol. It contains ethyl chlorid 17 per cent., chloroform 35.89 per cent., and ether 47.10 per cent., representing a proportion of about 1 : 2 : 3. Its boiling-point is 104° F. Meyer has used it in many cases for four years past and is very well satisfied with it. It should be given by the drop method with an Esmarch mask. The patients do not struggle, the pulse does not vary much, but respiration at times becomes shallow. The anesthesia caused is not very deep, and some of the reflexes may not be lost. In

abdominal cases, therefore, morphin, gr. 1/12 to 1/4 may be given by hypo about half an hour before operation with excellent results. Salivation and cyanosis are absent and the awakening is quick. Vomiting varies, but is never persistent. Other sequelæ are rarely met with. Two deaths are reported, both after severe kidney operations and with marked shock due to the anesthetic.—*Medical News*.

Restoration of the Bridge of the Nose with Paraffin.—With a needle and a syringe and a bottle of paraffin, Paget (*Brit. Med. Journal*, September 13, 1902) finds it absurdly easy to remedy sunken deformities of the nose, deformities especially distressing because they are sometimes looked upon as positive evidence of syphilitic disease. He advises, however, certain precautions, as follows:

Whatever may be the melting-point of the paraffin, it must be kept, during use, ten degrees or fifteen degrees higher or it will solidify in the needle before it can be injected. For the same reason the needle and syringe must be kept fifteen or twenty degrees higher than the paraffin. The loss of heat from the syringe may be to some extent checked by casing it in a bit of drainage-tube. An ordinary glass antitoxin syringe, with a well-fitting asbestos piston, answers every purpose. The needle must be broad and strong, such as is used for exploring the pleural cavity; but the needle generally used for this purpose is too long, and should be shortened to an inch and a half.

An assistant must make firm pressure, very carefully, all around the nose, and must keep up this pressure till the paraffin be set. But it sets almost at once, allowing only a quarter or half a minute to the surgeon to mold it. The firm pressure may be helped by the use of a strip of lead or pewter under the tips of the fingers. The skin of the nose, at the point where the needle is to enter, should be just nicked with a scalpel, so that the needle may pass easily. It is best to direct the needle downward, away from the eyelids, and to introduce it at the middle line of the nose.

Eckstein's paraffin, melting at 136°, is difficult to use and must be very quickly transferred from the bottle into the subcutaneous tissue. Probably it is best suited for a case where only a very small quantity of paraffin is required. With this paraffin the syringe must be kept so hot that it can hardly be handled except with gloves.

One case has been recorded of sloughing of

the skin, presumably from heat. This disaster could hardly happen with paraffin melting at 115°. More than one case has been recorded where signs attributable to pulmonary embolism followed the injection. It is therefore necessary to avoid a vein, and to keep firm and close pressure all around the nose during and after the injection.

After the treatment a fold of lint should be kept over the upper part of the face, and kept moist with cold or iced lotion. In the two cases treated by Paget there was little or no pain after the operation, but there was some swelling round the nose for three or four days.—*Therapeutic Gazette*.

HINTS, QUERIES, AND COMMENTS.

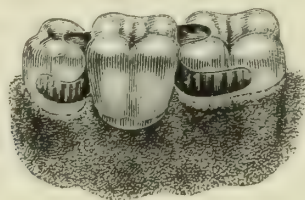
A REMOVABLE BRIDGE.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I am sending you under separate cover a combination appliance which has proved so useful that others may have the advantage of using it.

The method of construction of this appliance is as follows:

First, obtain an accurate impression with modeling compound or plaster of Paris, together with the antagonizing tooth; prepare



the clasps with lugs, and after shaping the bar, grind the tooth, preferably a plate tooth, to saddle it. Bake with the bar in position, and contour with any high-fusing body. I have used the Allen continuous gum body prepared by The S. S. White Dental Mfg. Co., veneering with any enameling body, with uniform success. This same principle may be used when crowns are used, or any other method of attachment. I know of nothing that makes a cleaner, stronger, or more satisfactory appliance.

Yours truly,

C. FRANK BLIVEN.

WORCESTER, MASS.

A HINT IN ROOT-FILLING.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Here is a little "trick" that occasionally serves me in conservative treatment of the pulp: new to me, this, but so very simple that it is, most likely, very old.

With the dressing and cap in position, mix a bit of cement to the consistence of thick cream and place a drop upon the cap. A few quick, vigorous, and properly directed puffs from the air syringe will spread the cement nicely over the cap and dressing, and without exerting pressure. When set, this serves to hold the cap in place while the filling proper is inserted. Yours truly,

L. S. EDWARDS.

BRATTLEBORO, VT., May 15, 1903.

CARBORUNDUM FOR PAINLESS WORK.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—To make the heart glad, get a couple of porte-polishers, No. 305 of combination catalogue, and a box of carborundum points (cylinders, not rubber). These points may be set in the mandrel with modeling compound. A little hole drilled in the side to expel the air is still better, and offers a vent for the removal of a broken point. These points are just plain cylinders, but one mandrel point should be sharpened on a revolving wheel for opening up small cavities. Sensitive patients and children will let you work with this when they would not put up with burs for a moment. Yours truly,

W. H. ALBRIGHT.

BELLEVUE, OHIO.

DENTAL LEGISLATION.

DENTAL LAW FOR THE TERRITORY OF HAWAII.

[ACT 40.]

AN ACT TO REGULATE THE PRACTICE OF DENTAL SURGERY IN THE TERRITORY OF HAWAII.

Preamble to Act.

WHEREAS, the health and comfort of the public, and in many instances the lives of individuals, are contingent upon intelligent and competent dental services; and

WHEREAS, properly educated and efficient practitioners of dentistry are, therefore, a public necessity:

Be it enacted by the Legislature of the Territory of Hawaii:

SECTION 1. All persons shall be held to be practicing dentistry within the meaning of this Act who shall charge a fee or salary or other reward, to be paid either to him or to some other person, for operations or parts of operations of any kind in the treatment of diseases or lesions of the human teeth or jaws, or extracting teeth, or in the correction of the malformation thereof; provided, that nothing in this Act shall apply to regularly licensed physicians or surgeons in extracting teeth or performing surgical operations.

SEC. 2. The following persons shall be deemed licensed to practice dentistry in this Territory:

(1) Those who are at the passage of this Act duly licensed and registered as dentists pursuant to the laws of the Territory of Hawaii, and

(2) Those who may hereafter be duly licensed and registered as dentists pursuant to the provisions of this Act.

SEC. 3. There shall be appointed a Board of Dental Examiners which shall consist of three practicing dentists who shall have been engaged in the continuous practice of dentistry in the Territory of Hawaii for a period of three years preceding their several appointments. The members of such Board shall be appointed by the Governor and such appointment shall be by recommendation of the Dental Society of Hawaii.

The term for which the members of said

Board shall hold office shall be three years, except that the members of the Board first to be appointed under this Act shall be appointed by the Governor to serve, one for the term of one year, one for the term of two years, and one for the term of three years.

SEC. 4. The Board shall, at its first meeting, elect one of its members president, and one secretary and treasurer thereof, and the Board shall meet in July of each year, and at such other times as shall be necessary, due notice of the times and places of which meetings shall be given by publication in some newspaper of general circulation in the Territory. A majority of the Board shall constitute a quorum.

SEC. 5. Any person twenty-one years of age and of good moral character, who has graduated at, and holds a diploma from, a reputable dental college, and who desires to practice dentistry in this Territory, shall file his or her application with and pay to the secretary of the Board a fee of twenty dollars, which in no case shall be refunded, and present himself or herself for examination at the first meeting of the Board after such application, and upon passing an examination satisfactory to the Board, his or her name, age, nationality, location, and number of years of practice shall be entered in a book kept for that purpose, and a certificate of license to practice shall be issued to such person.

SEC. 6. Every person engaged in the practice of dentistry, or dental surgery, within the Territory at the time of the passage of this Act shall, within three months thereafter, cause his or her name, residence, and place of business to be registered with said Board, and pay a fee of one dollar, upon the payment of which the Board shall issue to such person a certificate of license, duly signed and sealed.

SEC. 7. All certificates of license issued by the Board shall be signed by each member thereof, sealed and attested by the secretary, and shall be presumptive evidence of the right of the holder to practice dentistry in this Territory; and no person, association, or

company, whether incorporated or not, shall practice dentistry within this Territory without first having procured such a certificate, except as hereinbefore provided. Any person, association, or company practicing dentistry within this Territory and not having at the time a valid and uncanceled license shall be guilty of a failure to comply with the provisions of this Act, and upon conviction thereof shall be punished as hereinafter provided.

SEC. 7a. If any dentist shall be guilty of gross negligence, indecent conduct toward patients, or any such professional misbehavior as to show unfitness on the part of the dentist to practice, he or she shall be guilty of misdemeanor, and upon presentation to the Board by three or more persons of such facts, certified, the license of such dentist shall be canceled and such fact shall be noted on the record of licenses. Any person whose license shall be so canceled shall be deemed an unlicensed person within the meaning of this Act.

SEC. 8. Upon presentation to the Board of a certified copy of a court of record, showing that a practitioner of dentistry has been convicted of a felony, that fact shall be noted on the record of licenses, and shall be marked "canceled." Any person whose license shall be so canceled shall be deemed an unlicensed person, and as such shall be subject to the penalties prescribed for other unlicensed persons who practice dentistry in this Territory.

SEC. 9. Nothing in the provisions of this Act shall be construed to permit the performance of dental operations by an unlicensed person under cover of the name of a registered and licensed practitioner, and no person shall practice dentistry under an assumed name, title, or degree. Any person practicing dentistry under a false or assumed name, or who shall assume the degree of "Doctor of Dental Surgery" or "Doctor of Dental Medicine" or shall append the letters "D.D.S." or "D.M.D." to his or her name, the same not having been duly conferred on him or her by some college or school legally empowered to confer the same; or shall assume any title or append any letters to his or her name with intent to represent falsely that he or she has received a dental degree or license, shall be guilty of a failure to comply with the provisions of this Act, and upon conviction thereof, shall be punished as hereinafter provided.

SEC. 10. Any person who shall extract teeth or perform any other operation pertaining to dentistry for the purpose of advertising, exhibiting, or selling any medicine,

instrument, or business of any description, whether the extraction or operation be for pay or not, shall be guilty of a misdemeanor, and upon conviction thereof in any court of the Territory shall be fined in a sum of not more than two hundred dollars.

SEC. 11. Every association or company of persons, whether incorporated or not, engaged in the practice of dentistry under the name of company, association, or other title, shall cause to be displayed and kept in a conspicuous place at the entrance to its place of business the names of each and every person employed by said association in the practice of dentistry; and every person so employed by any association or company shall cause his or her name to be so displayed. Any person employed by such company or association whose name shall not be displayed as above provided shall be guilty of a failure to comply with the provisions of this Act, and upon conviction thereof shall be punished as hereinafter provided; and the company or association, if incorporated, or the persons comprising the same, if not incorporated, shall, for failure to display the aforesaid names, be guilty of a failure to comply with the provisions of this Act, and upon conviction thereof shall be punished as hereinafter provided.

SEC. 12. It shall be the duty of every person, company, or association practicing dentistry in this Territory, upon demand in writing by the secretary of the Board, to furnish within fifteen days after such demand, to the Board, through its secretary, a true statement of the name and address of each and every person practicing dentistry or assisting in the practice thereof, in the office of said person, company, or association, together with a statement showing under what license or authority the said person, company, or association is practicing; and any person, company, or association failing so to do, or making any false statement concerning or touching anything covered by this section shall be guilty of a failure to comply with the provisions of this Act, and upon conviction thereof shall be punished as hereinafter provided.

SEC. 13. All expenses of the Board shall be paid from the fees received by the Board under the provisions of this Act, and no salary or other expenses shall be paid out of the treasury of the Territory, and all money received by the Board shall be held by the treasurer thereof as a special fund for meeting the expenses of the Board.

SEC. 14. The secretary of the Board shall make a report of its proceedings to the Gov-

ernor of the Territory, with an account of all moneys received and expended by the Board, on or before the fifteenth day of January of each year.

SEC. 15. Any person, company, or association who shall fail to comply with each and every provision of this Act, penalty for the violation of which is not otherwise provided, shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not more than five hundred dollars.

SEC. 16. It shall be the duty of the several prosecuting officers of the Territory to institute, on notice from any member of the Board, prosecutions for offenses under this Act.

SEC. 17. All laws and parts of laws in conflict with this Act are hereby repealed, and this Act shall be in force and effect from and after its approval.

Approved this 25th day of April, 1903.

SANFORD B. DOLE,

Governor of the Territory of Hawaii.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS: June and July 1903.

JUNE.

CALIFORNIA STATE DENTAL ASSOCIATION. San Francisco. Four days: June 9th to 12th.

COLORADO STATE DENTAL ASSOCIATION. Denver. Three days: June 16th to 18th.

CONNECTICUT ODONTOLOGICAL SOCIETY. New Haven. June 16th.

GEORGIA STATE DENTAL SOCIETY. Tallulah Falls. June 9th.

IDAHO STATE DENTAL SOCIETY. Boise City. June 9th.

INDIANA STATE DENTAL ASSOCIATION. Indianapolis. Three days: June 30th, July 1st and 2d.

MASSACHUSETTS DENTAL SOCIETY. Boston. Two days: June 3d and 4th.

NORTH CAROLINA DENTAL SOCIETY. Winston. Three days: June 17th, 18th, and 19th.

JULY.

MAINE DENTAL SOCIETY. Kineo, Moosehead Lake. Three days: July 21st, 22d, and 23d.

MICHIGAN DENTAL SOCIETY. Petosky, Mich. Date not yet announced.

NATIONAL DENTAL ASSOCIATION. Asheville, N. C. July 28th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. Asheville, N. C. July 24th, 25th, and 27th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. Asheville, N. C. July 24th.

NATIONAL ASSOCIATION OF COLORED DENTISTS. Washington, D. C. Three days: July 2d, 3d, and 4th.

NEW JERSEY STATE DENTAL SOCIETY. Asbury Park. Three days: July 15th to 17th.

PENNSYLVANIA STATE DENTAL SOCIETY. Wilkesbarre. Three days: July 7th to 9th.

RHODE ISLAND DENTAL SOCIETY. Newport. July 14th.

TENNESSEE STATE DENTAL ASSOCIATION. Lookout Mountain. Three days: July 23d, 24th, and 25th.

VIRGINIA STATE DENTAL ASSOCIATION. Hot Springs, Va. July 22d, 23d, and 24th.

WISCONSIN STATE DENTAL SOCIETY. West Superior. July 21st, 22d, and 23d.

State Board Meetings.

COLORADO STATE BOARD OF DENTAL EXAMINERS. Denver. June 2d.

DELAWARE STATE BOARD OF DENTAL EXAMINERS. Wilmington. July 1st.

DISTRICT OF COLUMBIA BOARD OF DENTAL EXAMINERS. Washington, D. C. July 14th.

GEORGIA STATE BOARD OF DENTAL EXAMINERS. Tallulah Falls. June 9th.

INDIANA STATE BOARD OF DENTAL EXAMINERS. Indianapolis. June 9th.

MAINE STATE BOARD OF DENTAL EXAMINERS. Portland. June 24th.

MASSACHUSETTS BOARD OF REGISTRATION IN DENTISTRY. June 24th to 26th.

MONTANA STATE BOARD OF DENTAL EXAMINERS. Helena. June 16th, 17th, and 18th.

NEW JERSEY STATE BOARD OF REGISTRATION AND EXAMINATION IN DENTISTRY. Trenton. July 7th to 9th.

NORTH DAKOTA BOARD OF DENTAL EXAMINERS. Grand Forks. July 10th.

NORTH CAROLINA STATE BOARD OF DENTAL EXAMINERS. Winston. June 15th.

OHIO STATE BOARD OF DENTAL EXAMINERS. Columbus. June 30th, July 1st and 2d.

PENNSYLVANIA STATE BOARD OF DENTAL EXAMINERS. Philadelphia and Pittsburg. June 9th to 12th.

RHODE ISLAND BOARD OF REGISTRATION IN DENTISTRY. Providence. June 29th.

SOUTH CAROLINA BOARD OF DENTAL EXAMINERS. White Stone Lithia Springs. July 20th, 21st, and 22d.

TENNESSEE STATE BOARD OF DENTAL EXAMINERS. Lookout Mountain. July 23d, 24th, and 25th.

VERMONT BOARD OF DENTAL EXAMINERS. Montpelier. July 14th.

VIRGINIA STATE BOARD OF DENTAL EXAMINERS. Richmond. June 9th.

WEST VIRGINIA STATE BOARD OF DENTAL EXAMINERS. Charleston. June 3d, 4th, and 5th.

NATIONAL DENTAL ASSOCIATION.

THE National Dental Association will meet in Asheville, N. C., Tuesday, July 28, 1903.

Preparations are being made for one of the best meetings in the history of the Association. The section officers are preparing a program which, from a scientific and practical standpoint, will be difficult to excel. The clinics will be made a special feature.

All dentists interested in the advancement of the profession should attend this meeting.

All state and local societies should elect delegates who will be sure to attend the national meeting, they being entitled to one delegate for every six of their members.

The usual railroad rates will be had on all roads in the United States and part of Canada—one fare and a third, on the certificate plan.

L. G. NOEL, *Pres.*, Nashville, Tenn.

A. H. PECK, *Rec. Sec'y*, Chicago, Ill.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will meet at Asheville, N. C., July 24, 25, and 27, 1903.

J. P. ROOT, *Sec'y*.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE National Association of Dental Faculties will convene in the ballroom of the Battery Park Hotel, Asheville, N. C., Friday, July 24, 1903, at 11 A.M.

The Executive Committee is called to meet at the same place, Thursday, July 23d, at 2.30 P.M. Parties having business with this committee are hereby notified to be on hand at this time.

H. B. TILESTON, *Chairman*,

S. W. FOSTER, *Sec'y*,

Ex. Com. N.A.D.F.

MASSACHUSETTS DENTAL SOCIETY.

THE thirty-ninth annual meeting of the Massachusetts Dental Society will be held in Boston, in Mechanics Building, on Wednesday and Thursday, June 3 and 4, 1903.

EDGAR O. KINSMAN, *Sec'y*,
Cambridge, Mass.

CALIFORNIA STATE DENTAL ASSOCIATION.

THE thirty-second annual meeting of the California State Dental Association will be held in San Francisco, beginning June 9th and continuing for four days. A large attendance is expected, the committee having furnished an excellent program.

O. P. ROLLER, *Cor. Sec'y*.

CONNECTICUT ODONTOLOGICAL SOCIETY.

THE Connecticut Odontological Society will hold its third annual meeting at the Young Men's Republican Club, corner of Crown and Temple streets, New Haven, Conn., on Tuesday, June 16, 1903, beginning at 10.30 A.M.

J. HAMMOND MALLERY, *Ch'man Ex. Com.*,
26 State st., Hartford, Conn.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE Pennsylvania State Dental Society will hold its thirty-fifth annual meeting at Wilkes-

barre, Pa., July 7, 8, and 9, 1903. An interesting and varied program has been arranged, and a large attendance is assured.

C. V. KRATZER, *Sec'y*.

INDIANA STATE DENTAL ASSOCIATION.

THE forty-fifth annual meeting of the Indiana State Dental Association will be held at Indianapolis, June 30, July 1 and 2, 1903. A splendid program is being arranged by the executive committee, and a most cordial welcome will be extended to those who attend.

F. R. McCLANAHAN, *Sec'y*.

NEW JERSEY STATE DENTAL SOCIETY.

THE thirty-third annual meeting of the New Jersey State Dental Society will be held in the Auditorium, Asbury Park, commencing at 10 o'clock, Wednesday, July 15, and continuing during July 16 and 17, 1903.

Four papers by eminent practitioners will be read, and, as was the case last year, the exhibits will be a greater feature than ever.

With the immense floor space at disposal everything new and novel in dentistry will be shown. Forty clinicians have promised to be present.

The Columbia Hotel, opposite the Auditorium, will be the headquarters, and the rates \$2.50 and \$3.00 per day.

Mark the date off to-day, and come on July 15th. You will be made welcome.

CHAS. A. MEEKER, *Sec'y*, Newark, N. J.

MAINE DENTAL SOCIETY.

THE thirty-eighth annual meeting of the Maine Dental Society will be held at Kineo, Moosehead Lake, July 21, 22, and 23, 1903.

This is an ideal opportunity to visit this beautiful spot, the most attractive summer resort in the state.

All dentists are cordially invited to meet with us, and we especially extend an invitation to those who are natives of Maine to participate in a pleasant and profitable reunion. We are to have papers and clinics by men of national reputation, including Dr. L.

P. Haskell of Chicago, Dr. W. A. Capon of Philadelphia, and Dr. R. Ottolengui of New York.

The Mount Kineo House accommodates five hundred guests and grants us half rates on this occasion.

Reduced railroad rates from Portland.

C. H. HAINES, *Ch'man Ex. Com.*,
Dexter, Me.

WISCONSIN STATE DENTAL SOCIETY.

THE thirty-third annual meeting of the Wisconsin State Dental Society will be held at West Superior, Wis., July 21, 22, and 23, 1903. The usual railroad rates will be obtained. The profession is cordially invited to be present.

T. M. WELCH, *Pres.*, Waupun, Wis.

W. H. MUELLER, *Sec'y*, Madison, Wis.

TENNESSEE DENTAL ASSOCIATION.

THE next meeting of the Tennessee Dental Association will be held at Lookout Mountain, Chattanooga, Tenn., July 23d, 24th, and 25th.

The outlook is bright for the best meeting in the history of the association. Contributions have been promised from many eminent in the profession, both from Tennessee and other states.

A one and one-third rate of fare on the certificate plan has been secured. Those wishing to attend the meeting of the National Dental Association at Asheville, N. C., can deposit return tickets with the agent at Chattanooga, and take up the same on their return trip.

All members are urged to be present and a cordial invitation is attended to all ethical dentists to attend and take part in the proceedings.

A. SIDNEY PAGE, *Sec'y*.

G. V. BLACK DENTAL CLUB.

AT a meeting of the G. V. Black Dental Club of Chicago, the following officers were elected for 1903: F. B. Noyes, president; A. D. Black, vice-president; R. W. Parker, secretary and treasurer.

R. W. PARKER, *Sec'y*, Chicago, Ill.

NEW YORK STATE DENTAL SOCIETY.

At the annual meeting of the New York State Dental Society held at Albany, N. Y., May 13, and 14, 1903, the following officers were elected for the ensuing year: R. H. Hofheinz, Rochester, president; W. J. Turner, Brooklyn, vice-president; W. A. White, Phelps, secretary; C. W. Stainton, Buffalo, treasurer; A. R. Cooke, Syracuse, correspondent.

W. A. WHITE, *Sec'y*, Phelps, N. Y.

CHICAGO DENTAL SOCIETY.

At the annual meeting of the Chicago Dental Society, held in Schiller Hall, Tuesday evening, April 7, 1903, the following officers were elected: Donald M. Gallie, president; W. H. Taggart, first vice-president; G. W. Dittmar, second vice-president; Winthrop Girling, recording secretary; A. E. Morey, corresponding secretary; C. P. Pruyn, treasurer; J. H. Woolley, librarian; J. E. Hinkins, member of Board of Directors. Board of Censors—A. W. Harlan, chairman; C. N. Johnson, W. V-B. Ames.

A. E. MOREY, *Cor. Sec'y*,
31 Washington st., Chicago, Ill.

SIXTH DISTRICT DENTAL SOCIETY.

At the thirty-fifth annual meeting of the Sixth District Dental Society of the State of New York, held May 7, 1903, the following officers were elected: Francis M. Wills, Ithaca, president; Albert V. Needham, Oneida, vice-president; Frederic M. McCall, Binghamton, secretary; Herbert D. Whitmarsh, Binghamton, treasurer. Board of Censors—M. Hoffman Fish, New Berlin; Frank B. Darby, Elmira, and Edwin D. Downs, Owego. Delegates to state society (four years from 1900)—E. D. Downs, Owego, and E. L. Pitcher, Coopers-town. (Four years from 1901)—C. F. Baylis, Oneonta, and H. D. Whitmarsh, Binghamton. (Four years from 1902)—W. J. Le Suer, Oneonta, and C. M. Dunne, Norwich. (Four years from 1903)—C. G. Bassett, Sidney, and J. V. Flaherty, Chittenango.

FRED. W. MCCALL, *Sec'y*,
Binghamton, N. Y.

VERMONT STATE DENTAL SOCIETY.

At the twenty-seventh annual meeting of the Vermont State Dental Society, held at Burlington, Vt., March 18, 19, and 20, 1903, the following officers were elected for the ensuing year: J. Holmes Jackson, Burlington, president; H. Burbridge, Woodstock, first vice-president; Geo. F. Barber, Brattleboro, second vice-president; Thomas Mound, Rutland, secretary; Grace L. Bosworth, Rutland, corresponding secretary; W. H. Munsell, Wells River, treasurer; J. A. Robinson, Morrisville, state prosecutor. Executive Committee—Geo. O. Mitchell, St. Albans; J. Churchill Hindes, Vergennes, and C. H. Kent, Barre.

The next meeting will be held at Montpelier, on the third Wednesday in March, 1904.

THOMAS MOUND, *Sec'y*.

COLORADO BOARD OF DENTAL EXAMINERS.

THE Colorado State Board of Dental Examiners will meet at Denver, June 2, 1903. All applications for examinations must be filed with the secretary before that date.

M. S. FRASER, *Sec'y*,
407 Mack Bldg., Denver.

WEST VIRGINIA STATE BOARD OF DENTAL EXAMINERS.

THE West Virginia State Board of Dental Examiners will hold its regular spring meeting for examinations on June 3, 4, and 5, 1903, at Charleston, W. Va. For further particulars address

W. A. WILLIAMS, *Sec'y*,
Huntington, W. Va.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburg, June 9 to 12, 1903.

Address the Dental Council, Harrisburg, Pa., for application papers and further particulars.

G. W. KLUMP, *Sec'y*,
Williamsport, Pa.

VIRGINIA BOARD OF DENTAL EXAMINERS.

THE next meeting of the Virginia State Board of Dental Examiners will be held in Richmond, Va., beginning Tuesday morning, June 9, 1903.

R. H. WALKER, *Sec'y*, Norfolk, Va.

NORTH CAROLINA BOARD OF DENTAL EXAMINERS.

THE North Carolina State Board of Dental Examiners will meet in Winston, Salem, N. C., at 10 A.M., on Monday, June 15, 1903. All applications for license must be filed with the secretary on or before that date.

In addition to the written examination applicants will be required to fill with gold at least one approximal cavity selected by the Board.

They must also bring a partial upper denture (of not less than eight teeth) ready for soldering—hand soldering required. Work must be done under the supervision of the Board and materials and instruments furnished by the applicant.

R. H. JONES, *Sec'y*, Winston, N. C.

MASSACHUSETTS BOARD OF REGISTRATION.

THE next meeting of the Massachusetts Board of Registration in Dentistry for the examination of applicants will be held June 24, 25, and 26, 1903.

Application blanks and all necessary information furnished by the secretary.

G. E. MITCHELL, *Sec'y*,

25 Merrimack st., Haverhill, Mass.

SOUTH CAROLINA BOARD OF DENTAL EXAMINERS.

THE South Carolina State Board of Dental Examiners will hold its regular annual meeting for examinations July 20, 21, and 22, 1903, at White Stone Lithia Springs, S. C. It is necessary for applicants to come prepared to stand examinations—theoretical and practical. Diplomas should be presented with application.

BROOKS RUTLEDGE, *Sec'y*, Florence, S. C.

OHIO BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of the State of Ohio will meet at the Hartman Hotel, Columbus, June 30, July 1 and 2, 1903, for the purpose of examining candidates for certificates of registration.

All applications should be filed with the secretary by June 20th.

For further particulars address

H. C. BROWN, *Sec'y*,

12 E. Broad st., Columbus, Ohio.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination on Tuesday, Wednesday, and Thursday, July 7, 8, and 9, 1903, in the assembly room of the Statehouse at Trenton, N. J.

Session begins promptly at 9 A.M.

All applications must be in the hands of the secretary ten days prior to the examination.

J. ALLEN OSMUN, *Sec'y*.

VERMONT BOARD OF DENTAL EXAMINERS.

THE Vermont Board of Dental Examiners hereby give notice that they will meet at the Pavilion Hotel, Montpelier, Vt., on Tuesday, July 14, 1903, at 2 P.M., for the examination of candidates to practice dentistry.

Applications, with the fee (ten dollars), must be filed on or before July 5, 1903.

Application blanks, together with rules and instructions to candidates, can be had by applying to

GEO. F. CHENEY, *Sec'y*, St. Johnsbury, Vt.

TENNESSEE BOARD OF DENTAL EXAMINERS.

THE Tennessee State Board of Dental Examiners will meet at Lookout Mountain, Chattanooga, Tenn., July 23, 24, and 25, 1903, for the examination of candidates for licenses to practice dentistry.

DENTAL COLLEGE COMMENCEMENTS.

UNIVERSITY OF MARYLAND, DEPARTMENT OF DENTAL SURGERY.

THE annual commencement exercises of the Department of Dental Surgery of the University of Maryland were held in Chase's Lyceum Theater, Baltimore, Md., on Wednesday, April 29, 1903.

The address to the graduates was delivered by A. Douglass McConachie, M.D., D.D.S., and the class oration by D. Brown Lewers.

The degree of D.D.S. was conferred on the following graduates:

Merill Jason Barber.....	Canada.	D. Brown Lewers.....	England.
Eldridge Baskin	South Carolina.	Milton R. Lisbona.....	New York.
Albert F. G. Bedinger.....	New York.	Louis Henry Mann.....	North Carolina.
A. Marvin Bell.....	Canada.	Howard A. Manning.....	Massachusetts.
Frank G. Blackburn.....	Pennsylvania.	Wilmot L. McCutchen.....	South Carolina.
E. Fred Briggs.....	Maine.	Charles E. McLaughlin....	Canada.
William D. Bumgarner....	Pennsylvania.	Carlton Burns Mott.....	North Carolina.
William B. Burns.....	Pennsylvania.	Thomas R. Myers.....	Maryland.
W. Treadwell Conyers.....	Bermuda, B. W. I.	Irvin T. Naille.....	Pennsylvania.
Eugene DeFernelon	Belgium.	Fred. Rising Newell.....	Vermont.
Ervin Joseph Diehl.....	Pennsylvania.	B. Forrest Orear.....	Missouri.
Edward Augustus Early ..	South Carolina.	George Truman Partridge..	New York.
Charles Ashley Ellett.....	Virginia.	Aubrey A. Posey.....	Maryland.
John Harry Feamster.....	West Virginia.	J. Herbert Prudhomme....	Louisiana.
Achilles F. Felix.....	Massachusetts.	George Edgar Rawlins.....	California.
Perry Marcellus Fitch.....	New York.	Elmer W. Remsberg.....	Maryland.
James D. Fording.....	Ohio.	Edward Rice	Alabama.
Ernest C. Garrison.....	Virginia.	Harry Hawkins Sargent...	Pennsylvania.
Albert H. Gough.....	Delaware.	Benjamin Franklin Selby..	Maryland.
Horace Littlefield Gould...	Maine.	Frank D. Shupp.....	Maryland.
John H. Hamer, Jr.....	South Carolina.	Charles Andrew Spahn....	New Jersey.
Jesse E. Herbert.....	West Virginia.	Robert Wilmer Sprinkel...	Virginia.
Francis Augustus Hoodner.	Pennsylvania.	Parke P. Starke.....	Virginia.
Augustus Hilleary Hosack.	West Virginia.	Robert Edward Lee Strickler	Virginia.
Ira C. Ide.....	New York.	George Hume Stuart, M.D..	Maryland.
Stayley G. Jackson.....	Canada.	Joseph A. Taylor.....	Indiana.
Le Roy Dennis Jenkins....	Georgia.	Herbert M. Thomas.....	Pennsylvania.
Claude Charles Jones.....	Louisiana.	Minor H. Turrentine.....	Georgia.
Noah E. Kefauver.....	Maryland.	Francis J. Valentine.....	Maryland.
Joseph P. P. Knep.....	New Jersey.	L. Le Roy Watkins.....	Maryland.
Lambert Kumle, Jr.....	California.	Eugene T. Watson.....	West Virginia.
E. McIvor Law, Jr.....	Florida.	Ralph Milton Whitney.....	Maine.

NEW ORLEANS COLLEGE OF DENTISTRY.

THE annual commencement exercises of the New Orleans College of Dentistry were held at Tulane Theater, New Orleans, on Monday, May 4, 1903.

The salutatorian was Cilton A. Couvillon, and the valedictorian E. J. Gourdain.

The degree of D.D.S. was conferred on the following graduates:

Cilton Alfred Couvillon.	Edward J. Gourdain.	Judson H. McCann.
John Chase Crimen, Jr.	Lawrence C. Leggett.	Benjamin Julius Nasits.
Joseph Bowen Davis.	Arthur Lemoine.	Walter John Rodriguez.
A. Louis Ducasse.	Perry Gray Lovenskjold.	Richard Cornelius Root.
Marie-Blanche Fassy.	Mitchel Mansberg.	Rupert Everett Watson.

PHILADELPHIA DENTAL COLLEGE.

THE fortieth annual commencement exercises of the Philadelphia Dental College were held at the Academy of Music, Philadelphia, on Friday, May 1, 1903.

The address to the graduates was delivered by Prof. L. Greenbaum, M.D., D.D.S., and the valedictory by George H. Eppley, D.D.S.

The degree of D.D.S. was conferred on the following graduates:

Agustin Abalo, B.A.....	Cuba.	Sidnie Helen Kirsch.....	Austria.
Luiz Maria d'Agrella, M.D....	Portugal.	E. Vorslund Kjaer, Tandlage..	Denmark.
George H. Arbeely.....	Syria.	E. Fred Knarr.....	Pennsylvania.
Godfrey Emerson Barnsley....	Brazil.	Marcus M. Koflen.....	New York.
Frederick W. Bergman.....	Massachusetts	W. Wallace M. Kramer.....	Pennsylvania.
George Benjamin Bleiler.....	Pennsylvania.	Alexander S. Linton.....	Jamaica.
George E. Bolles, Ph.G.....	Connecticut.	Irvile Elston Luce.....	Maine.
Francis Joseph Boslett.....	Pennsylvania.	Foster Barber Macdonald....	Pennsylvania.
William F. Bottomley.....	Pennsylvania.	Matthew M. Mahoney.....	Massachusetts
Paolo Bottoni, M.D.....	Italy.	James Henry Maloney.....	Massachusetts
Herbert Wills Brown.....	New Jersey.	Charles B. Masseth.....	New York.
Walter Norcross Brown.....	Massachusetts	Warren Matlack.....	Pennsylvania.
Augustus J. Brubaker.....	Pennsylvania.	Fred Wolcott Meakin.....	Utah.
Ernest C. Bruce.....	New York.	Clarence A. Milks.....	New York.
William Franklin Bush.....	Pennsylvania.	William Moody	Canada.
L. Bruce Campbell.....	Pennsylvania.	John James MacDonald, Jr....	Connecticut.
James Francis Casey.....	New York.	James Charles MacPhail.....	Canada.
Frank E. Chumar.....	New Jersey.	Frank Balliet McNinch.....	Pennsylvania.
Harry C. Clemmer.....	Pennsylvania.	Herman Goldsmith Nailor....	Delaware.
Arthur B. Coll.....	Pennsylvania.	Thomas Ogle Naughton.....	Australia.
Elmer Lincoln Cotton.....	New Jersey.	Frederick Henry Neubert....	Pennsylvania.
Jesse W. Covington.....	Maryland.	René R. M. de la Neuville....	Massachusetts
Willard Blanchard Coy.....	Massachusetts	Martin James Noble.....	Pennsylvania.
Don Carlos Craighead.....	Pennsylvania.	John Theodore Parks.....	Canada.
Kenneth Eugene Crooks.....	Pennsylvania.	Samuel B. Patchell.....	Pennsylvania.
Andrew Jackson Culver.....	Vermont.	Alfred Henry Pearse.....	Pennsylvania.
Harry Dier	Canada.	LeRoy E. Peirce.....	Vermont.
Roy Branwood Dier.....	Canada.	Louis E. Pfitzenmaier.....	Australia.
John Francis Doherty.....	Massachusetts	Merrick Clifford Phillips....	New York.
William T. Dunn.....	Massachusetts	Irwin James Porter.....	Canada.
Rufus W. Earl.....	New York.	Arthur J. Prytz.....	Australia.
Robert B. Elzey.....	Maryland.	Robert Cortland Reid.....	Canada.
George Hoover Eppley.....	Pennsylvania.	Charles Melvin Robinson....	Maine.
J. Ralph Erb.....	Pennsylvania.	Joseph L. Robinson.....	Pennsylvania.
Martin Joseph Fallon.....	Massachusetts	Max Rothenberg	New York.
Harrison Wader Ferguson....	New York.	John Henry Ryan.....	Massachusetts
Jesse C. Forbes.....	Connecticut.	William Albert Sanders.....	Canada.
Peter L. Frey.....	Pennsylvania.	Samuel Schwartzman	Roumania.
Edwin L. Fulton.....	Illinois.	John Henry Shea.....	Maine.
T. Allen Ganung, Jr., Ph.G....	New York.	J. Nelson Sherwood.....	New York.
Archibald Y. Gray.....	Canada.	Frederick Sobel	New York.
Harvey M. Gsell.....	Kansas.	Frederick Rose Solmes.....	Canada.
Dudley Guilford, Ph.B.....	Pennsylvania.	Patrick Sidney Spark.....	Australia.
Alice Gertrude Harvie.....	Rhode Island.	Frederic Charles Stansby....	Bermuda.
Otto G. Hess.....	Pennsylvania.	Judge Futhey Steele.....	Pennsylvania.
Henry James Hunt.....	Canada.	Gilbert Haven Stephens.....	Illinois.
Robert McClean Hunter.....	Pennsylvania.	Walter Fay Stephens.....	New York.
William Scott Hunter.....	Pennsylvania.	Amos G. Strance.....	Pennsylvania.
John Lane Husband.....	Canada.	Clarence Norman Trout.....	Pennsylvania.
Thomas Herbert Imeson.....	New York.	Roland O. Waite.....	Maine.
Robert James Inglis.....	New Jersey.	Warren L. Wallace.....	New York.
Frederick Russell Jacobs....	Connecticut.	Barzillia Rhume West, Jr....	Pennsylvania.
Perry William Johnson.....	New York.	Francis Bayard Wilson.....	Pennsylvania.
Ernest A. Johnston.....	Mississippi.	William G. Wilson.....	Canada.
Harvey Glenn Jones.....	Pennsylvania.	Joseph James Witschger....	Pennsylvania.
Lloyd Joslyn	New York.	Alfred G. Wright.....	Pennsylvania.
Julius Kahn	New York.	George Clark Young.....	New Jersey.
James Henry Kane.....	Connecticut.	George Dibrell Young.....	Tennessee.
Gerald D. Kenna.....	Australia.	Franz Zeliska, M.D.....	Austria.
George H. Killian.....	Pennsylvania.	Lewis Zweighaft.....	New York.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE forty-seventh annual commencement exercises of the Pennsylvania College of Dental Surgery were held at the Academy of Music, Philadelphia, on Saturday evening, May 2, 1903.

The address to the graduates was delivered by Prof. W. J. Roe, M.D., D.D.S.

The degree of D.D.S. was conferred by the president, I. Minis Hays, M.D., on the following graduates:

William Addelston.....	Pennsylvania.	J. M. Kelleher.....	Pennsylvania.
W. H. Aschenbach.....	Pennsylvania.	J. L. Kniseley.....	Pennsylvania.
M. W. Bachman.....	Pennsylvania.	H. F. Knowlton.....	Massachusetts.
Morris Barrin.....	Pennsylvania.	Ulisses Lopez.....	Porto Rico.
A. P. Beardsley.....	Massachusetts.	D. E. McAvoy.....	New York.
J. K. Beatty.....	Pennsylvania.	H. W. McCloskey.....	Pennsylvania.
A. C. Bickelhaupt.....	New York.	M. V. McGinnis.....	Pennsylvania.
Geo. W. Blymer.....	Pennsylvania.	J. A. McKeown.....	Pennsylvania.
L. De Those Borde.....	West Indies.	Robert S. McVea.....	New York.
Wilbert Brands.....	New Jersey.	Jos. B. A. Masson.....	France.
I. G. Brasie.....	New York.	G. B. Merrell.....	Pennsylvania.
M. S. Bresch.....	Russia.	R. B. Montelius.....	Pennsylvania.
F. P. Cavallo.....	New York.	H. S. Nahar.....	Pennsylvania.
Albert E. Clarke.....	Pennsylvania.	A. L. Orr.....	Pennsylvania.
C. H. Clarke.....	Pennsylvania.	A. J. Overbey.....	North Carolina.
C. H. Cole.....	Canada.	M. B. Parris.....	Pennsylvania.
J. A. Conway.....	Pennsylvania.	F. C. Pitcher.....	New York.
Jos. T. Comroe.....	Pennsylvania.	V. Polakoff.....	Pennsylvania.
H. Culbertson.....	Pennsylvania.	M. Polonsky.....	Pennsylvania.
Jennie Davis.....	Pennsylvania.	J. E. Reaser.....	New Jersey.
E. A. Doussou.....	Cuba.	C. G. Reimer.....	Pennsylvania.
A. Dubuc.....	Venezuela.	A. R. Ross.....	Indiana.
J. W. Duffy.....	Pennsylvania.	N. L. Rubin.....	Pennsylvania.
C. S. Emerson.....	Canada.	M. C. Russell.....	Pennsylvania.
E. N. Englander.....	Pennsylvania.	W. F. Salvat.....	Wisconsin.
A. M. Escarza.....	Cuba.	C. N. Smith.....	Connecticut.
John Evans.....	Pennsylvania.	J. H. Smith.....	Massachusetts.
Clarence M. Fairtile.....	Massachusetts.	H. E. Snow.....	Massachusetts.
L. S. Flower.....	Pennsylvania.	M. Solot.....	New York.
O. Fritsch.....	Pennsylvania.	C. Strailey.....	Pennsylvania.
C. H. Gangeware.....	Pennsylvania.	L. Strauman.....	Pennsylvania.
J. M. Gartman.....	Pennsylvania.	C. D. Thomas.....	Pennsylvania.
Robert S. Ginns.....	Pennsylvania.	Howard LeRoy Tindell.....	New Jersey.
Luke F. Grady.....	Pennsylvania.	U. Grant Turner.....	Pennsylvania.
B. A. Green.....	Massachusetts.	A. F. Twogood.....	Massachusetts.
R. G. Hall.....	New York.	F. E. Uffenheimer.....	New Hampshire.
H. E. Hodge.....	New York.	M. Weiman.....	Russia.
H. Hook.....	Pennsylvania.	B. N. Whaling.....	New York.
P. Husick.....	Pennsylvania.	J. Fernley Whitaker.....	New Jersey.
T. A. Hutchison.....	Pennsylvania.	Thomas S. Wilcox.....	Pennsylvania.

CINCINNATI COLLEGE OF DENTAL SURGERY.

THE tenth annual commencement exercises of the Cincinnati College of Dental Surgery were held in Cincinnati, at Sinton Hall, Y. M. C. A., on Wednesday, May 6, 1903.

An address to the graduates was delivered by the dean, Prof. G. S. Junkerman, and the valedictory address by Hon. Warren Gard.

The degree of D.D.S. was conferred by Hon. Francis B. James, president of the board of trustees, on the following graduates:

G. F. Barre.....	Ohio.	W. A. Klusemeier.....	Kentucky.
T. B. Castleman.....	Kentucky.	F. Lush.....	Ohio.
A. A. Drummond.....	Ohio.	F. B. Parrish.....	Ohio.
L. W. Dunham.....	Ohio.	J. N. Sadler.....	Ohio.
C. S. Dye.....	Ohio.	H. Saslavsky.....	Ohio.
B. Harlin.....	Indiana.	N. S. West.....	Kentucky.
J. Jansen.....	Ohio.	W. H. Wright.....	Ohio.
C. C. Kemper.....	Kentucky.		

OHIO COLLEGE OF DENTAL SURGERY.

THE fifty-seventh annual commencement exercises of the Ohio College of Dental Surgery were held in Robinson's Opera House, Cincinnati, Ohio, on Thursday evening, May 7, 1903.

The address to the graduates was delivered by Guy Potter Benton, D.D., president of Miami University, Oxford, Ohio, and the valedictory address by Paul Cassidy.

Dr. Charles I. Keely, secretary of the board of trustees, conferred the degree of D.D.S. on the following graduates:

George M. Bachelor.....	Michigan.	Frank L. Kinnison.....	West Virginia.
Jeddy D. Becker.....	Indiana.	Edward John Lang.....	Ohio.
Fred. G. Beroset.....	Ohio.	Bennie A. Long.....	Pennsylvania.
Isaac Dodd Best.....	Kentucky.	Marion M. Lower.....	Ohio.
George P. Bichler.....	Ohio.	Charles H. McCall.....	Ohio.
Jerry Emery Blosser.....	Ohio.	Hugh C. McClelland.....	Ohio.
Andrew Wall Boyd.....	Ohio.	Frank A. McCullough.....	Ohio.
Charles A. Brown.....	Ohio.	Thomas W. McFadden.....	Ohio.
Homer Thomas Brown.....	Indiana.	Abram B. McKague.....	Canada.
Ewing V. Burns.....	Ohio.	Gavin W. McMillan.....	Ohio.
Robert C. Cameron.....	Ohio.	George LeRoy Mallett.....	Ohio.
Garfield Canon.....	Pennsylvania.	Phister H. Martin.....	Ohio.
Paul Cassidy.....	Kentucky.	Robert Guy Morris.....	Illinois.
Fordyce H. Chapman.....	West Virginia.	Harvey B. Morrow.....	Wisconsin.
William E. Chester.....	Ohio.	Harry J. Morlidge.....	Kentucky.
Edward H. Clarkson.....	Florida.	A. Clarence Musgrave, M.D....	Ohio.
George Evans Collins.....	Kentucky.	George Nerish.....	Ohio.
Gilbert E. Conroy.....	Illinois.	William F. O'Donnell.....	Ohio.
Ellery C. Cox.....	Ohio.	Roscoe E. Peelle.....	Ohio.
James Ogden Crutcher.....	Kentucky.	R. Ray Peters.....	Ohio.
Henry Elmer Davis.....	Illinois.	Robert E. Plath.....	Minnesota.
Edgar Horace Eberle.....	Ohio.	Everett H. Price.....	Indiana.
Bert J. Edwards.....	Ohio.	John E. Price.....	Ohio.
Abraham Eiseman.....	Ohio.	J. Harry Rardon.....	Ohio.
Julius B. Ellison.....	Ohio.	Harry Maltby Rogers.....	Ohio.
Edward B. Eshman.....	Ohio.	Archie J. Rose.....	Pennsylvania.
George Stanley Evans.....	Ohio.	Harry E. Rudman.....	West Virginia.
Robert E. Fishback.....	Kentucky.	Frank G. Sandker.....	Ohio.
Bruce David Flaughner.....	Ohio.	Willis F. Sanford.....	Ohio.
Harry Charles Frayer.....	Minnesota.	Carlos H. Schott.....	Ohio.
J. Carson Gow.....	West Virginia.	John W. Shaffer.....	Indiana.
Henry I. Grimes.....	Illinois.	Orvis Singmaster.....	Iowa.
Augustus R. Hammerle.....	Ohio.	Dickson L. Singleton.....	Pennsylvania.
Wilbur E. Hoffhines.....	Ohio.	Jay Walter Stroh.....	Indiana.
John R. Hoffman.....	Ohio.	Allen D. Sullivan.....	Kentucky.
William A. Holtz.....	Ohio.	Willie Ildo Tate.....	Indiana.
*Charles E. Hutchinson.....	West Virginia.	Sidney R. Teasdale.....	Ohio.
Jennie D. Jenkins.....	Ohio.	A. Verden Watkins.....	Ohio.
Arthur G. Johnson.....	Ohio.	Nathan M. West.....	Ohio.
Ralph K. Kemper.....	West Virginia.	Fred. H. Williams.....	Ohio.
Charles F. Kirkland.....	Indiana.	Ray Wolfe.....	Ohio.

*Deceased.

OHIO MEDICAL UNIVERSITY, DENTAL DEPARTMENT.

THE eleventh annual commencement exercises of the Dental Department of the Ohio Medical University were held in the Great Southern Theater, Columbus, Ohio, on Thursday, April 16, 1903.

The annual address was delivered by Rev. Carl G. Doney, A.M., Ph.D.

Hon. Fred. G. Heer, president of the Board of Trustees, conferred the degree of D.D.S. on the following graduates:

Carl A. Allensworth.	Phelps MacFreer.	James Hodge McCreary.
Robert Lincoln Armstrong.	Mitchell A. Gebert.	Hova Emerson McKelvey.
Orville Taylor Atwell.	Frank August Goldenstar.	Edward Enoch Neary.
Charles Albert Beck.	Frank Stanley Goss.	James Otto Newton.
Joseph Bertine Bell.	Harry White Groves.	Charles Wesley Reelhorn.
James Evered Berry.	Walter Ford Hall.	George Wilbur Riche.
Alexander Caldwell Buffington.	George Ellsworth Harrison.	Charles Truman Rogers.
George Washington Bourne.	Charles Henry Herbst.	Ervin Earl Royer.
Horatio Abner Boulger.	Ernest Frederick Izin.	Harry L. Ruble.
Alexis Emanuel Caron.	Karl Young James.	Calvin Law Shafor.
William Brewster Carr.	Carl Baker Jeffrey.	Leslie Edgar Sharp.
Charles Bernard Cox.	Charles Bertram Keller.	Baron Alfred Smith.
Homer Campbell Crawford.	Robert Jink Kirk.	Frank John Smith.
Charles Chesney Cummins.	Clark M. Leiblee.	Ray Richard Smith.
Wilbert Roy Davis.	Leon Munroe Marshall.	Herbert Stephenson Srigley.
Preston Fletcher Dixon.	George Winfield May.	William Crooks Teter.
Ervin Garfield Dougherty.	Earl Leroy Miley.	Roy Everett Turner.
James Clifford Downar.	Thomas Corwin Miller.	Edward Earl Wattring.
Carl John Fackiner.	William Egbert Modie.	Sylvester Skilling Whetstone.
George Howard Foster.	Philip Monroe.	George Wing.
Walter Damon Franck.	Joseph Albert McCallum.	

UNIVERSITY OF BUFFALO, DENTAL DEPARTMENT.

THE eleventh annual exercises of the Department of Dentistry of the University of Buffalo were held at the Teck Theater, Buffalo, N. Y., on Tuesday, May 5, 1903.

The degree of D.D.S. was conferred on the following graduates:

William Ward Algate.	William J. Herbig.	Edgar Delmont Newton.
Lee Allyn Badger.	Percy Addison Holdridge.	Dewitt Clinton Northrup.
George Henry Brickwedde.	Ernest Elmer Horton.	Thomas Francis O'Brien.
George Barclay Brown.	Frank Fayette Jenkins.	Charles Lewis Overpeck.
Robert Brown.	Emil Peter Jung.	Gracia Abigail Naomi Paxson.
Frank Silas Burlingame.	Harry Simpson Kennedy.	Karl Ames Penfield.
Roy William Burlingame.	William Henry Lane.	Walter Edward Pike.
William Watson Bush.	Ernest Ralph Lascell.	Harold Rockefeller.
Joseph Jefferson Cantwell.	Clarence Anson Leek.	Clifford Ezra Rose.
Winfield Byron Capron.	Ross Garfield Leonard.	Charles Edward Rowland.
Alphonse Clarence Champagne.	John Augustus Lockwood.	Raymond Frederick Southwick.
Oscar Roberts Charles.	Archibald Meredith MacGachen.	Flavius Bernard Stiker.
Charles Mitchell Craner.	Joseph Francis Magner.	Raymond Botsford Tafft.
William McClellan DeCeul.	David Talbot Main.	Harry Flagler Tanner.
Arthur Warren Dieffenbach.	Charles Ricketson Mair.	William Benjamin Tanzer.
Chester Richard Downes.	Milton Ross Marlatt.	Clarence Hovey Thomas.
Henry Edward Elliott.	Roswell Howard MacDonald.	Raymond Elliott Thomson.
Walter Healy Ellis.	William Wescott McElroy.	Edwin LaFayette Todd.
Thomas Edward Evans.	George Alton McIlroy.	Elberta Orlette Tousey.
James Blanchard Fish.	Charles Everett McIntosh.	Richard Vernon Turner.
William Humphorous Fyffe.	Henry Clay Millis.	Daniel James Vedder, Jr.
George Wilbur Gardner.	Warren Ray Montgomery.	Kenneth Downs Watson.
Harlan Foster Guillaume.	Howard Herman Moyer.	Charles Bougie Watts.
Oscar J. Hammersmith.	Lawrence Lee Mulcahy.	Wiley Hardy Wilson.
Fred Ernest Harper.	Harvey Hotchkiss Newcomb.	Florence Wrean Wilson.

WESTERN DENTAL COLLEGE.

THE thirteenth annual commencement exercises of the Western Dental College were held at the Century Theater, Kansas City, Mo., April 29, 1903.

The annual address was delivered by Dr. Matthew S. Hughes.

The degree of D.D.S. was conferred on the following graduates:

Elbert Seymour Bement.	Martin Lewis Ingram.	John Henry Schlecht.
Franklin Oliver Bollock.	William Courtney King.	Norton J. Scott.
Walter Scott Bowden.	Robert Watson Krotzer.	Lucien Edwin Scouten.
Clifford Elzea Brown.	Daniel Everett Lamont.	Ernest William Smedley.
Harold William Brown.	Ernest Ossian Lawing.	William Arthur Stewart.
Frank H. Burgin.	James Augustus Longinotti.	Benjamin Franklin Stewart
Benjamin Wood Cave.	Milton Green McAlister.	Francis Gray Stiffler.
Edwin Mace Chapman.	Alfred B. McKeehan.	August Elmer Swanson.
Frank Brown Collins.	Fred Seward Mead.	John Edward Taylor.
Cornelius Henry Creighton.	Albert Robert Miller.	George Clarence Trusty.
Merna Beauchamp Crume.	Fanny Zerelda Miner.	William Henry Tuttle.
Robert Hampton Ewing.	Andrew Latimer Munroe.	Willard Edwin Tucker.
Richard August Frye.	Burd Odell.	Edward Ewing Tydings.
Julius Guffy.	John Edward O'Grady.	Ray Ashton West.
J. H. Gummo.	C. Joe Rhoads.	William Henry Wheat.
Glenn Alaga Hedrick.	Rena Minerva Robinson.	Frank Bates Wilson.
Lewis Eugene Hoard.	Vincent Munger Robinson.	Joseph Homer Williams.
Howard Kelsey Houston.	Marvin Leslie Rowe.	Henry Courtney Woods.
John Robinson Hull.	Herbert Carroll Rogers.	Bernie Lee Worthley.
Bert Hume.	William David Rubidge.	Charles Cartar Youmans.

KANSAS CITY DENTAL COLLEGE.

THE twenty-second annual commencement exercises of the Kansas City Dental College were held in the Central High School Auditorium, Kansas City, May 4, 1903.

The annual banquet was at the Hotel Baltimore.

The degree of D.D.S. was conferred on the following graduates:

Frank Elwood Allen.	Fred Hugh Enloe.	Marvin Burt Miller.
Hubert M. Bamford.	Edwin Leonard Feese.	Mark James Painton.
Gustave Joseph Boehringer.	Roy Walter Grandstaff.	James Henson Proffitt.
Earl Archibald Bonar.	Edouard Montgomery Hall.	John Thomas Reed.
Charles Ray Briggs.	Smith Beatty Hanna.	John Quinn Robertson.
Clyde Bellamy Burnett.	Ernest Watson Kennedy.	Otis Lester Smith.
Edward Oliver Campbell.	Virgil Rogers McCue.	Claude Oscar Tesch.
Fenton Morton Canoyer.	Frank Marian McFarland.	Andrew Bruce Waring.
Joel Aaron Curtis.	Harry Hancock McKee.	Arthur Frank Weston.
Enoch David Enloe.		

UNIVERSITY OF TENNESSEE, DENTAL DEPARTMENT.

THE twenty-fifth annual commencement exercises of the Dental Department of the University of Tennessee were held in Watkins Hall, Nashville, Tenn., on Monday evening, May 4, 1903.

An address was delivered by Hon. Jas. M. Head.

The degree of D.D.S. was conferred on the following graduates:

B. G. Atlee, Jr.....Mexico.	J. T. Hayes.....Tennessee.
K. H. Barnes.....Kentucky.	T. S. Hughes.....Mississippi.
R. L. Blanton.....Tennessee.	Ed. Matthews.....Missouri.
E. E. Bullock.....Mississippi.	E. S. Mixon.....Louisiana.
J. M. Cole.....Tennessee.	A. M. Noel.....Tennessee.
J. T. Ferguson.....Tennessee.	J. T. Walker.....Kentucky.
C. F. Glenn.....North Carolina.	J. W. Winn.....Tennessee.
S. R. Hardison.....Tennessee.	E. O. Wells.....Tennessee.

BALTIMORE COLLEGE OF DENTAL SURGERY.

THE sixty-third annual commencement exercises of the Baltimore College of Dental Surgery were held in the Academy of Music, Baltimore, Md., on Thursday, April 30, 1903.

The annual oration was delivered by Hon. G. L. Wellington, and the valedictory by Charles L. Thompson, D.D.S.

The degree of D.D.S. was conferred on the following graduates:

G. H. Alford.....	Maryland.	E. W. Green.....	Mississippi.
B. F. Allen.....	Vermont.	F. E. Hatch.....	New York.
E. J. Arcand.....	Massachusetts.	L. Hess	New York.
G. E. Armacost.....	Maryland.	J. H. Jessop.....	Pennsylvania.
H. L. Averill.....	Vermont.	J. H. Kelly.....	New York.
S. T. Bailey.....	West Virginia.	J. T. Kennedy.....	Massachusetts.
G. S. Belaval.....	Porto Rico.	G. R. Love.....	Ohio.
J. S. Blanchard.....	Vermont.	W. A. Mabie.....	New York.
J. T. Block.....	Denmark.	I. L. Mansbach.....	Maryland.
M. P. Bosley.....	Maryland.	J. L. Metcalf.....	Texas.
T. B. Brady.....	Massachusetts.	T. D. Morrison.....	Nova Scotia.
H. E. Buckner.....	Maryland.	H. Naylor	Texas.
G. Carr	Pennsylvania.	W. O'Neill	Vermont.
J. F. Clark.....	Rhode Island.	G. P. Payzant.....	Nova Scotia.
C. D. Clough.....	Nova Scotia.	J. W. Pletcher.....	Pennsylvania.
C. C. Condon.....	Oregon.	J. M. Porter.....	Maryland.
J. B. Crocker.....	Nova Scotia.	J. L. Rice.....	New York.
I. H. Davis.....	North Carolina.	W. A. Ribble.....	Pennsylvania.
A. E. Da Silveira.....	Azores.	T. Robertson	Canada.
E. Deichman	Maryland.	M. P. Shobe.....	Indian Territory.
W. H. Donovan.....	Pennsylvania.	M. M. Shea.....	Massachusetts.
C. E. Dunn.....	Jamaica.	N. L. Soule.....	Vermont.
J. H. Elliott.....	Nova Scotia.	C. Smith	New York.
H. P. Emeis.....	Utah.	F. S. Smith.....	Canada.
E. J. Evans.....	North Carolina.	W. O. Smith.....	Pennsylvania.
C. E. Foster.....	Missouri.	C. L. Thompson.....	Canada.
M. R. Geidner.....	Pennsylvania.	W. A. Trethewey.....	Nova Scotia.
H. M. Gibson.....	North Carolina.	E. C. Vitou.....	Massachusetts.
C. B. Green.....	Canada.		

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING APRIL 1903.

April 7.

No. 724,838, to SIDELL E. FISH. Dental appliance.

April 14.

No. 725,033, to ISAAC N. BRIGHAM. Dental chair.

No. 725,506, to SAMUEL G. SUPPLEE. Dental plate.

No. 725,542, to GRAHAM CLARKE. Apparatus for administering gas.

April 28.

No. 726,381, to VICTOR VON UNRUH. Dental bridgework.

No. 726,644, to JOHN R. COMINS. Seamless gold crown for teeth.

No. 726,771, to WARREN M. SHARP. Core for casting molds for tooth caps.

No. 726,772, to WARREN M. SHARP. Device for drawing metal tooth caps.

THE DENTAL COSMOS.

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No. 7.

ORIGINAL COMMUNICATIONS.

A CONTRIBUTION TO THE STUDY OF METABOLISM.

By **EDWARD C. KIRK, D.D.S., Sc.D.**

(Read before the New York State Dental Society, at Albany, N. Y., May 14, 1903.)

IN the study of disease one may attack the problem from a variety of stand-points selected with reference to the kind of result, practical or philosophic, which one may desire to attain. Thus the empiric is satisfied with the knowledge of any means which will effect a cure, and is without interest in either the therapeutic principles involved or the etiology of the disorder which he treats.

The complexity of the phenomena presented by morbid vital action, and the extent to which comfortable living and the pursuit of happiness are involved therein, have, however, constantly stimulated investigation into the more occult causes of disease, to the end that in the light of a knowledge of its origin there might be revealed to us the solution of its prevention and successful treatment.

Out of this effort to discover the true solution of disease phenomena have grown the modern methods of laboratory research in pathology and physiology, as well as the immense fund of knowledge comprising the results of bacteriological research as a factor in disease causation.

As a consequence of the enormous accumulation of data due to the modern methods of research in medical science, empiricism as a factor in the practice of all departments of the healing art is being rapidly eliminated, so that the practitioner of the present is compelled to equip himself by careful and thorough training in the science of his calling if he would succeed in the rational treatment of disease.

The increasing quest for definite knowledge as to vital phenomena in both their normal and abnormal expressions has wrought, and is constantly bringing about, changes of attitude in professional thought and modes of practice.

The effects produced upon ancient ideas of pathology by the discovery of the relation of bacteria to disease causation was revolutionary, and the advances made in our conceptions of etiology with the corresponding readjustment of therapeutics in harmony therewith has constituted perhaps the most important epoch in medical science. There are, however, evidences that the advance guard of medical research is shifting its

ground somewhat for a new point of attack upon the problem of disease causation. Bacterial pathology as a science has developed to such a degree that we may now say in general terms that we know how pathogenic bacteria cause disease, and the working out of individual problems in that line concerns simple matters of detail based upon broad and well-known general principles. The new field of research that confronts us is not a question of how bacteria cause disease, but why in certain instances they do not. In other words the problems of immunity and susceptibility—those conditions of the bodily organism which determine whether disease invasion can or cannot take place—are the burning problems which biological research is now concerned with, and upon which so much of great pith and moment to human health and happiness depends.

The problems of dental pathology are simply the problems of general pathology specialized with respect to the territory with which they are concerned, and the same basal principles are common to both.

THE CONSTITUTIONAL FACTOR.

It is my purpose to-day to invite your attention to some of the fundamental considerations which it seems to me we must take into account in dealing with the pathological conditions we are called upon to treat in the mouth, and mainly to attempt to clear up somewhat that vexed and much-discussed problem of the constitutional or systemic factor in relation to diseases of the dental and oral structures.

We are all familiar with the wordy warfare that has been waged around the question of whether pyorrhea is a constitutional or a local disorder, and that problem will serve as the *pièce de résistance* in illustrating the principles which I desire to bring before you. Let me at the outset define the limitations with which for present purposes I shall invest that much-misused term "pyorrhea alveolaris." I exclude for the present all those cases of destructive gingivitis in which the disease is manifestly a filth

disease strictly localized in character, due to the impingement of salivary calculus upon the gingival margin, in which the infection is superficial and the resulting inflammation is of the ulcerative type, and which is curable solely by the complete removal of the obvious cause.

The disorder to which I ask your attention is that type of chronic suppurative necrotic inflammation in which the infection of the retentive structures of the tooth is deep-seated, where the suppurative inflammation is of the abscess type rather than the ulcerative, where salivary tartar is not the obvious irritative cause, and where local treatment alone is inadequate to effect a cure or prevent a recurrence of the disorder, and especially where some error in the nutritional processes of the individual is a constant factor in the case.

I am aware that many of our profession will not be inclined to admit that the constitutional factor of faulty nutrition has any bearing on the local pyorrheal trouble under consideration, but it is for precisely that reason that I have selected this pathological condition as an illustrative one to defend the broad general principle that under normal nutritional conditions the human organism is, broadly speaking, not vulnerable to the invasion of those mouth bacteria which in these pyorrheal patients are the exciters of the necrotic inflammatory process.

We are greatly indebted in my opinion to the work and observations of Peirce, Talbot, Rhein, and others who have called our attention with much emphasis to the importance of constitutional conditions of malnutrition as predisposing factors in the causation of pyorrhea; for the more closely we investigate the matter and the more intimately we recognize the data of nutrition in its normal and aberrant expressions the more clearly do we see the direct bearing which nutrition exerts upon the phenomena of disease invasion.

SYSTEMIC PHENOMENA IN PYORRHEA.

From the purely clinical standpoint every practitioner will admit that as a

class the pyorrheal cases under consideration are generally associated with certain more or less evident aberrations from normal health. I think there can be no division of opinion as to the fact, so that whatever differences we may have in this connection will be as regards the interpretation of the fact.

It is claimed by certain observers that the ill health of a patient with attendant indigestion, constipation, and bilious attacks, loss of flesh, headache, etc., are symptoms caused by the constant swallowing of pus germs and infected food contaminated with the mouth bacteria and their toxins; therefore, if the mouth be made healthy by local treatment the constitutional symptoms and bad health will necessarily disappear. The reasoning is strictly of the *post hoc ergo propter hoc* order, and is like the old farmer who said that "down where he lived they swore by Abraham Lincoln and God Almighty," and who was, according to the lamented president's opinion, "only about half right."

Two facts which anyone may verify upon careful investigation prove the error of the position of those who regard the pyorrheal condition as the cause of the systemic disturbance. First, the cure of the pyorrhea does not cure the constitutional malnutrition, though we admit at once and freely that the local pyorrheal treatment may and often does improve the general health of the patient. Second, a careful and intelligent investigation of the case will show that the malnutrition was a chronic condition long antedating the pyorrheal outbreak, which is therefore a symptom or indication of malnutrition, and not its cause. The causal relation of pyorrhea to ill health is important in so far as it is an active factor in the production of a so-called vicious circle which intensifies an original constitutional vice.

In the study of malnutrition in connection with lesions of the oral and dental tissues I have during the past year been compelled from the results of my laboratory research to fundamentally reorganize my conceptions of the meaning of malnutrition. I had previously ap-

plied that term to individuals who were obviously out of health, or whose subjective symptoms led them to seek relief from some disorder of bodily function. Investigation of a large number of cases by analysis of the saliva and the urine has convinced me that slight impairment and abnormality in the nutritional processes may exist for long periods of time and without producing readily recognizable symptoms, but which nevertheless in due course so lower the vital potential of the individual as to ultimately make him vulnerable to disease invasion, and that in very many instances the disease invasion takes the form of an infection of the supporting structures of the teeth, producing so-called pyorrhea alveolaris.

We have so long been accustomed to the formula "Bacteria cause disease" that we overlook the equally important qualifying fact that they cause disease only when the internal resistive forces of the organism are so lowered as to be unequal to the task of preventing the bacterial invasion. The importance of the vital resistance of the organism as a protective influence against disease invasion has by no means been unrecognized among dental writers, but the magnificent proportions which the bacterial factor in disease causation has assumed in the minds of bacterial pathologists have tended to overshadow and obscure the factor of vital resistance, temporarily at least. The late Robert G. Ingersoll is, I believe, credited with the remark that if he could have had his way about it he would have made good health contagious instead of disease, and it is beginning to look as if the next step of scientific medical research was to be toward a practical realization of the Ingersollian ideal in that particular.

MODERN CONCEPTIONS OF THE NUTRITIONAL PROCESS.

Let us examine for a moment the modern conceptions of the nutritional process so that they may serve as the preliminary to an attempt at a better understanding of what malnutrition means

and how malnutrition may be a predisposing factor in bacterial invasion.

In a broad biological sense nutrition comprises two distinct processes or types of phenomena expressed in that unit of vitality, the living cell. First, a synthesis, or building-up process by which elementary or simple compound inorganic matter is serially constructed into molecular compounds of the greatest complexity; and second, an analytic process by which these highly complex compounds are split or broken down again into simpler compounds, some of which are thrown off by the organism as waste and others rebuilt into the higher compounds, to be again broken down as before. The first or synthetic process we call assimilation, and the second or analytic process we call dissimulation. It is somewhere along the line of these chemical mutations of the contents of the living cell that there is manifested that phenomenon which we call vitality or life, and it is in relation to the harmonious adjustment of the building up and the breaking down, the synthetic and analytic functions respectively of the cell protoplasm that the highest vital expression, the acme of life potential, is developed.

The building up of cellular protoplasm begins in the plant—in which it has its simplest expression—by the conversion of water and carbon dioxide into starch through the agency of chlorophyll, the analogue of hemoglobin in the animal body. The conversion of the vegetable starch into proteid through the use of it as food by animals constitutes a further synthesis, and in its final expression is the limit of the synthetic process by which the characteristic and highly complex compound, the proteid of animal protoplasm is developed. It is therefore the production, the breaking down, and the reconstruction of animal proteid which is comprehended in the general term “nutrition” as applied to living animals. As a graphic aid to a conception of the general factors involved in the nutritional process, Prof. Max Verworn has offered the following formula: Let A represent assimilation and D dissimila-

tion, then when $\frac{A}{D} = 1$ nutrition is normal, but when $\frac{A}{D} > 1$ or $\frac{A}{D} < 1$ then nutrition is abnormal, the first tending toward hypertrophy, the second toward atrophy, and both indicating a fall from normal vital potential and a corresponding inability to resist bacterial invasion—if indeed the conditions named may not in and of themselves be regarded as disease conditions.

SOME NEW INDICES OF FAULTY NUTRITION.

I have reported in other papers some results of my study of these constitutional errors in the nutritional process which I regard as the predisposing factors in disease causation, my investigations being largely confined to studies of the saliva and urine in connection with clinical cases of lithemia, arthritism, or that group of disorders dependent upon imperfect oxidation of the cell protoplasm. It is in connection with this condition—the hyperacid diathesis of Gautrelet, Bouchard, Michaels, and others—that we find pyorrhea often as a concomitant local disease. I have already reported the finding in both urine and saliva of waste products which practically demonstrate that imperfect or impaired oxidizing power is the fundamental diathetic fault. In a paper read before the fifteenth anniversary meeting of the Odontographic Society of Chicago I reported the finding of ammonium cyanate in the urine, and explained its significance in connection with disordered liver function and its importance as a source of abnormal loss of nitrogen with consequent derangement of nutrition. I further explained the mechanism of the loss of phosphorus in cases of so-called phosphaturia and the effects of the phosphorus-starvation thereby induced.

I wish now to call your attention to two other findings which occur in certain malnutritional states dependent upon imperfect oxidation and which not only develop toxemias but lower the vital standard in pyorrheal cases.

The appearance of oxalic acid as oxalates in the urine has long been recog-

nized as a clinical fact, and much difference of opinion as to its significance has been expressed. It is a well-known fact that oxalates may appear in the urine after the ingestion of certain foods, notably of tomatoes, which are known to contain oxalates in considerable amount, and the presence of oxalates in the urine has been therefore stated to have no significant bearing upon the question of faulty cell-metabolism. On the other hand, it can be shown beyond reasonable doubt that oxalic acid is produced as a side product from the cleavage of uric acid and some of its forerunners in the dissimilation of proteid, and its appearance in the urine in large quantities for a considerable length of time must be taken as an evidence of faulty metabolism.

Heretofore the reported findings of oxalic acid in the urine have always and only been made when the acid was in combination with calcium as calcium oxalate, in which form it is readily recognized under the microscope by reason of its characteristic crystalline form. I have found, however, in certain cases where the appearance of oxalate of lime in the urine is associated with other phenomena indicating a general faulty metabolism, that the period of the disease is one of well-advanced oxaluria in which the earlier stages were characterized by the loss of oxalic acid as sodium oxalate, a salt which can only be optically detected in the urine by means of the micropolariscope. These oxaluric cases are characterized by nervous manifestations, they are of the irritable neurasthenic type and usually of spare, anemic habit, and where the oxaluria is the index of a chronic faulty metabolism the oxalic acid is excreted in the early stages as a sodium combination followed later by the appearance of calcium oxalates in both saliva and urine.

Another and to me most interesting waste product, which I have recently determined in the urine of two cases of typical malnutrition, is lactic acid in combination as calcium lacto-phosphate and calcium lactate.

The fact is well known that lactic acid

in large quantities is produced in the organism from the carbohydrate moiety of proteid as a normal part of the nutritional process, but as lactic acid under normal conditions is never found in the excretions its destination in the economy was long a matter of doubt until the investigation of Minkowski threw light upon it. That investigator extirpated the liver in geese and found that thereafter they excreted not uric acid, as is the case with the normal goose, but instead of uric they excreted large quantities of lactic acid and ammonia in the quantitative relations of ammonium lactate; from which result he concluded, doubtless correctly, that ammonium lactate was the forerunner of uric acid in the economy, and was transformed into the latter compound through the agency of the liver.

The finding, therefore, of considerable quantities of calcium lactate and lacto-phosphate in the urine of the patients alluded to would strongly indicate a functionally disordered liver, one incapable of converting the lactates into urates. The exact extent of the liver disorder is yet to be determined, but that it exists in pronounced form is shown by the clinical examination as well as by the analysis of the urine.

FAULTY METABOLISM AND LOWERED VITALITY.

These faults of metabolism of which I have given but a cursory account are productive of lowered vitality in two ways: First, by depriving the organism of benefit expressed as high vital potential which is a result of the normal nutritional process; and second, by producing toxic waste products which accumulate in the blood and still further depress the vital resistance of the cellular elements nourished by the toxic blood-stream, and creating thereby a vicious nutritional circle.

It is these two factors—tissue starvation and auto-intoxication—which to me seem sufficient to account for the lowered vital tone which renders the individual vulnerable to the invasion of those dis-

ease-producing bacteria which under conditions of normal nutrition would be—and as a matter of fact are, for the most part—harmless.

From the viewpoint which I have endeavored to set before you it must be obvious not only that pyorrhea, within

the limitations which I have for present purposes confined that term, is the indication of a state of abnormal nutrition, but that, it being a result thereof, we must seek to remove the constitutional vice before we can hope to successfully treat the local disorder.

THE BEHAVIOR OF PLASTER OF PARIS.

By Dr. STEWART J. SPENCE, Chattanooga, Tenn.

AS long ago as 1882 the writer became interested in the subject of the behavior of plaster of Paris, and made a series of experiments with a view of finding the minimum of expansion with the maximum of hardness of this material, a record of which experiments was published in the *Cosmos* of that year,* and afterward incorporated in Professor Richardson's "Mechanical Dentistry." Not much, however, of practical value was then brought out, except the one very important fact that long stirring greatly increases the expansion of plaster of Paris, without adding hardness. Prior to that time the text-books had recommended long stirring.

As far as my researches then went, everything that decreased expansion also decreased hardness, and nothing I could then find would fully prevent expansion.

Some time after the publication of my article there appeared in the *Cosmos* a communication from Dr. Bowman MacLeod, a member of the faculty of the University of Edinburgh, describing some experiments with plaster of Paris which he had made on a large scale—two feet square. This article was also copied into Dr. Richardson's well-known text-book. In it Dr. MacLeod taught that potash alum in a specified quantity entirely prevents the expansion of plaster. I tried it, but could not get the results he claimed; the alum only partially reduced the expansion. Many

years later I again tried it, with similar unsatisfactory results. I then wrote to Dr. MacLeod, but he had died, and the letter was replied to by his successor in office, Dr. Munro, who confessed that the alum does not altogether control expansion. At the same time this gentleman explained that Dr. MacLeod's plaster cast had been surrounded by an iron band, on learning which it occurred to me that this fact might account for the phenomenon related by Dr. MacLeod, namely, that one of his blocks of plaster—the one mixed without alum—had bowed up so as to produce beneath it a space, which at its greatest height measured half an inch. This cast—though two feet square—was only about two inches thick. I conceived the idea that this upward bulging of the plaster might have been caused by its lateral expansion being restricted by the iron band. I tested this by making similar experiments,* first with and then without a band, and found that in the latter case the cast lay flat. Other experiments in the same line confirmed these first, and thus it was demonstrated that *restricted lateral expansion causes warping of plaster casts*. This fact is of practical value, because a restricting wall is always present in the flanges of impression trays, as also in the buccal surfaces of impres-

*DENTAL COSMOS, vol. xxiv, p. 614.

*For a fuller account of this experiment, and of some others referred to in this paper, see the writer's several articles in *Items of Interest*, commencing March 1902.

sions, and these cause a bowing up of both impression and model, thus doubly tending to produce in the plate the misfit known as "rocking on the palate."

This fact led the writer to turn to wax and modeling composition in order to find a non-expanding material for taking impressions.

CONTRACTION OF VARIOUS MODELING MATERIALS.

A series of experiments was made to find the exact contraction of wax, modeling composition, sticky wax, and paraffin. A lid of one of the metal boxes in which vulcanizable rubber is supplied to dentists was used in these tests. These boxes are, as we all know, nearly six inches long. The one used was filled with the material to be tested, which on cooling would shrink so as to leave a space between it and the end of the lid, which could be measured by inserting pieces of paper of known thickness. The paraffin contracted very much—about one-sixteenth of an inch in the six inches. The other three were about equal to each other, and about half that of the paraffin. The contraction of the modeling composition became perceptible at about 100° F. and was seen to proceed at the rate of one thickness of paper to each ten degrees until freezing-point was nearly reached. These seven thicknesses of paper measured about one-thirty-fifth of an inch; but as models are usually obtained from impressions at ordinary room temperature (about 70°), only about half of this contraction may be reckoned on in practice—about one-seventieth of an inch in six inches, or one one-hundred-and-fortieth of an inch in three inches. Numerous experiments which had been made to find the expansion of plaster of Paris had shown that *it rarely expands less than one-fiftieth of an inch in three inches—almost thrice greater than the contraction of modeling composition.*

These experiments to test the expansion of plaster of Paris had been made in three ways: (1) The rubber box lid before mentioned, (2) an upper impression tray, and (3) a scissors-like instrument

which acts somewhat like calipers, one pair of jaws being sunk in the plaster while soft, and the other pair opening outward as the plaster expands, and so indicating the degree of expansion.

It was seen, as I had found from experiments twenty years before, that to obtain a minimum of expansion the least possible stirring must be given to the mix. The difference in expansion between two casts, one stirred ten and the other sixty seconds, was as one to two-and-a-half. The short stirring, however, is open to the objection that it delays setting. The law is, *long stirring hastens setting and increases expansion and heat-evolution.*

Curious to observe the phenomena of plaster, the writer once, with a view to detecting the connection between heat-evolution and expansion, watched a setting cast in which had been placed the before-mentioned scissors-like instrument of measurement and saw that expansion ceased as soon as the heat had reached its highest, which was shown by a thermometer placed on the plaster. If, therefore, an impression has passed its season of highest heat it is useless to hurriedly pour the model with a view to getting a cast of the impression before the latter's expansion is complete. Indeed, with rapid-setting plaster this point of highest heat and full expansion may be reached even before the impression is removed from the mouth. With a slow-setting plaster it is not reached, in some instances, in less than half an hour. As above shown, expansion is great in a rapid-setting cast, and an impression which becomes hot before its removal should certainly be rejected.

But while the expansion which accompanies crystallization is soon over, there is expansion of plaster of Paris which proceeds slowly and requires about twenty-four hours for its completion. The writer would not have detected this second expansion but for the scissors-like instrument before mentioned, which on being left in a cast the crystallization-expansion of which had been measured and marked, was found next day to have expanded yet a little more. Surprised

at this, he concluded, like Robinson Crusoe when he saw the footprint on the sand, that probably it meant something, and further experiments were made to test it, which demonstrated that *there is a second expansion of plaster of Paris, taking place during the twenty-four hours following crystallization and amounting to about one-fourth to one-fifth its first expansion.*

This second expansion is insignificant, because of its smallness. Not so with a *third* expansion, which the writer found to exist in plaster of Paris models—this time in the vulcanizer. Being led to suspect that steam affects plaster casts, he subjected a number of old casts, which had been run in impression trays, to a bath at 320° F. for one hour, with the result that all came out very much expanded, as shown when they were returned to the trays in which they had been cast. *This third expansion was rather more than equal to the two former expansions put together.* Each succeeding vulcanization increased this swelling, until by the time they had gone into this vulcanizer four or five times there was a space of one-twelfth of an inch between cast and tray at the palatal dome.

It very naturally occurred to me that this expansion of plaster under steam might not take place in actual practice; that the pressure which the rubber exerts on the model might prevent swelling of the latter. This was tested by experiments, and it was shown that such resistance is insufficient for the purpose. A cast was run in an impression tray, upon which was made a vulcanite plate, from which the cast was carefully removed and returned to the tray. The expansion was found to be almost as great as though there had been no rubber in contact with the cast.

VULCANIZATION WITH DRY HEAT.

Finding that this swelling occurred only from wet vulcanization, and that it took place even when the water was reduced to only that contained in the crystallized plaster, the fact that it was caused by steam became obvious. I therefore undertook to vulcanize with

dry heat, using sand instead of water. The flask was placed in a melting-pot half filled with sand, over a flame, and a thermometer was inserted through a hole in the top of the flask and about half an inch into the investment. In about thirty minutes the thermometer would reach 212° F., where it would stand for about an hour, until the water in the plaster was evaporated as steam, and then it would rapidly rise, and unless the fire was shut off at about 270° it would rise beyond 320°, at which point it was well-nigh impossible to hold it steady. All this is because heat passes slowly through dry plaster, and such being the case the plate is of course most vulcanized at the points nearest the fire. To these difficulties must be added the consideration that the drying of plaster casts causes them to contract. Now, if this would produce a uniform contraction the evil would not be great, but I have demonstrated by other experiments that the parts of a cast nearest to the source of heat contract the most. This was done thus: A number of plaster casts which had been run in the lids of the before-mentioned metal boxes in which vulcanizable rubber comes to dentists, were placed over a flame, in a pot, in sand, standing up on their ends; thus one end of each piece was about six inches nearer the flame than was the other end. A thermometer in the sand near its surface registered 320° F. for an hour. The casts then showed a contraction in the three inches of width of about 2.0 mm. at the hotter end, and only about 0.5 mm. at the cooler. This demonstrates that an unequal contraction, or in other words a warpage, of plaster casts occurs when they are subjected to unequally distributed heat—a subject of vast importance to the worker in large bridges. These considerations led to the abandonment of dry vulcanization.

While the before-mentioned experiments were progressing, the writer was also working on the subject of the compression of plaster in flask-closing. Here also appeared a fertile source of misfit.

Many years ago I was seriously impressed with the fact that plaster is soft and easily compressed. This occurred while making some experiments with celluloid (the record of which may be found in Richardson's "Mechanical Dentistry"), when I found that "a small piece of celluloid placed in a flask filled with plaster which had been heated to 320° F. (dry heat), with no cavity made in the plaster to receive the celluloid, and closed in ten minutes, sunk a bed for itself in the hard plaster, flowing but little."

While thus knowing that celluloid would compress plaster, I was surprised lately to find how much rubber will do the same. My first experiment in this line was made thus: The lower half of a flask was filled with plaster, which was then oiled and the upper half poured. After being given four hours to harden this flask was opened and about fifteen grains of rubber placed in it, and it was closed in boiling water. No escape gates had been cut. The rubber was found to have sunk a depression in the plaster measuring at its greatest 0.5 mm. (about one-fiftieth of an inch). Other experiments were made with confirmatory results. One of these was intended to test the theory that the palatal dome just back of the rugæ would suffer most from compression because farthest from escape gates. While this is doubtless true, it was not clearly demonstrated, because another factor of greater weight was present: it was found that uneven packing of the rubber, by placing greater proportionate thicknesses of it at some places than at others, caused most compression at these places, and also that one side of the flask which had not been completely closed showed much less compression than the other side. Now, if compression of a model were equal at all parts, the result would be an equable diminution of the plate, and so perhaps a bettering of its adaptation to the mouth, but as compression, even with evenly packed rubber, is unequal, falling least on the buccal and labial surfaces, it must tend to produce a plate which rocks on the palate.

In seeking a remedy for this evil the writer's first efforts were with heat-dried plaster models. These were found considerably less compressible than those not dried. But for reasons already given, this method was abandoned. Next was tried partially dissolving the rubber before packing it by dipping it in chloroform, coal-oil, benzolin, and benzin. While any of these solvents render rubber so soft that the flask can be immediately closed without heat and with no compression of the model, they are open to other objections. They all retard vulcanization, especially coal-oil. Chloroform causes little pits in the vulcanite. Sometimes the vulcanite will be found shrunk away from the porcelain. It is next to impossible to keep out of joints rubber thus dissolved. Those dentists, however, who use plaster of Paris for models, the writer would not strongly dissuade from the use of these solvents. But presently I will "show unto you a more excellent way."

THE CONTRACTION OF VULCANITE.

In the course of the writer's investigation into the causes of misfits of vulcanite plates, the behavior of vulcanite itself came up for experiment. That this material contracts and warps is known to the profession through the text-books; but the amount of its contraction and the means of preventing it have not, I think, been hitherto published.

To measure vulcanite's contraction, I vulcanized rubber in long narrow boxes, about three inches long by one-quarter inch deep and wide. The first was misleading, showing only about 1/500-inch contraction in three inches; but, suspecting that the shrinkage in this case had not been free, but had been restrained by some extruding portions of vulcanite which had oozed out of the box at the edges of the lid, I trimmed away all these extrusions and then replaced the vulcanite bar in the box, being careful that it had freedom to move, and again ran it through the vulcanizer. Ah, this told the tale! The bar came out shrunk 1.5 mm. in its length of three inches.

A number of similar boxes were then made and various kinds of rubber were vulcanized in them. Very little difference was found in the contraction of these various rubbers, except in that of Doherty's "weighted," which showed only about half the shrinkage of the other.

Each succeeding vulcanization increased the contraction of these bars of vulcanite, until, when they had gone five or six times through the vulcanizer, it reached almost three millimeters. Then the contraction ceased and its opposite took place, expansion occurring with further vulcanizations.

Here appeared a source of mal-adaptation of plates worse even than the expansion of plaster in vulcanization, and nearly as bad as the three expansions of plaster combined. Indeed, but that, happily, one of these evils is an expansion and the other a contraction, so that they tend to neutralize one another, there would never have been a good-fitting vulcanite plate in the world; or rather, dentists would have been forced to dry vulcanization. Dry vulcanization is indeed a remedy for both these evils, and for that of compression as well, and were it not for its objectionable features it would deserve popularity. That with vulcanization the dentist sometimes makes a really good-fitting plate is due to the fact that the two expansions and one warpage of his impression, if of plaster, and its contraction if of wax or modeling compound, and the three expansions and one warpage of his model, sometimes happen to balance the compression of his model in flask-closing and the contraction (and probable resulting warpage) of his vulcanite plate in cooling. As this latter depends upon the strength of his plaster investment after vulcanization has occurred and while cooling is taking place, and as this strength depends largely upon whether the case was hurried into the vulcanizer soon after the investment was poured or else was given a night to harden, the whole thing is the merest game of chance, and there is no encouragement to the dentist to be

careful in any one of the steps, seeing that an error is as apt as anything else to bring him final success.

In seeking a remedy for this post-vulcanization contraction of vulcanite I received a clue from the before-mentioned extruding portions of vulcanite which had prevented at first the contraction of the rubber bar in the metal box. Following this clue, I imbedded in one of the boxes of rubber a bar of serrated Iridiumoid, with the result that the vulcanite came out unshrunk. The metal had arrested the contraction. Pursuing this idea, a similar strip of metal was fitted along the posterior palatal border of a plate to be vulcanized, with results markedly good. Contraction, however, showed between this posterior border and the incisor region. This last could, of course, be largely prevented by another serrated bar running along the line of the palatal suture. In lower plates such bars are doubly useful, strengthening the plate as well as reducing contraction. The writer therefore still uses them with lower plates, but has abandoned them for the upper, having discovered a better method of controlling vulcanite contraction.

A series of experiments was made to find the degree of heat at which the shrinkage of vulcanite begins and the ratio at which it proceeds with increased heat. To this end a bar of vulcanite, which had been vulcanized in one of the before-mentioned little metal boxes, was placed, together with the box, in water the temperature of which was rising. A thermometer was also placed in the water. At 130° F. the contraction began; at least, there was just a suspicion of it. At 140° the shrinkage amounted to one thickness of paper; at 150° to two thicknesses; at 160° to three to four thicknesses, and at 170° to seven to eight. The heat was then raised to 212°, which increased the contraction to fourteen thicknesses of the paper, which was of ordinary thickness, being cut from *Items of Interest*. This experiment is practically important, because indicating that over-large plates may be beneficially contracted by immersion for half a min-

ute in water heated to about 140° to 160° F. A half-minute's immersion caused as much shrinkage as did five minutes.

When studying dentistry I was taught that warpage of plates may occur from heat during polishing. This matter I have lately subjected to experiment, and now believe that the fear is ill-founded. As we have just now seen, a plate does not commence to contract until heated to 130° F., which is hotter than can with comfort be handled. Modeling composition is heated for impression-taking to nearly 115° F., when it is as hot as can be comfortably touched. Theory, therefore, would indicate that rubber plates do not warp in polishing. Experiment added evidence to this, viz: A thin partial vulcanite plate, of which an exact cast had been made with a non-expanding plaster, was polished at a high rate of speed, so as to heat it as much as could be done, and yet on being returned to the cast it was found unchanged in shape.

A PLASTER THAT "SETS HARD."

While engaged in making the experiments related in the foregoing pages, the writer has also been at work producing a new kind of plaster. He has refrained in this article from relating the multitude of experiments by which it has slowly been evolved, but to close this paper without mention of it would be like writing a treatise on malaria and saying nothing of quinin. Therefore, at the risk of appearing to advertise my goods in a purely scientific paper, I will say that my long search for a plaster from which is eliminated the two radical defects of plaster of Paris expansion and large compressibility has been crowned with most gratifying success; the plaster I concoct and supply to the profession has none of the three expansions of plaster of Paris, and sets so hard that when tested against Melotte's metal it is found to have about the same compressibility, this being almost fivefold superior to that of plaster of Paris, so that compression of the model during

flask-closing is secured against. So much of this hardness is retained throughout vulcanization that the investment comes out of it about tenfold harder than does plaster of Paris, thus having sufficient stability to resist all effort of the vulcanite to contract in cooling. This last statement applies only to the lateral contraction of a plate. Its vertical contraction, which must be considerable in very thick plates, does not come into the domain of an investist. A plate which is an inch thick ought to contract vertically, as previously related experiments show, about 0.5 mm. But the use of "weighted" rubber, which has only about half the contraction of other rubbers, will largely reduce this figure, as also will short serrated bars of metal placed vertically in the rubber; or still better, the employment of continuous-gum teeth, the long serrated roots of which are admirably adapted for restraining the vertical contraction of vulcanite.

Dr. S. B. Cook of this city lately suggested to me the use of this hard-setting plaster for swaging aluminum plates in the Parker shot swaging device. The first attempts were made with dies cast in impression trays, and though the dies cracked into several pieces it was noticed that when a piece was returned to its place in the tray it showed no compression. A full upper plate of a case in practice afterward made had excellent adaptation. Though the die broke into five pieces during the swaging, this seemed not to prevent its accurately doing its work, the broken pieces being probably forced together in swaging by the surrounding shot; so that a second die, though employed for security's sake, appeared superfluous.

The writer's experiments show that the dark joints of sectional gum dentures are caused principally by the spreading apart of the blocks in flask-closing—an evil which is reduced in proportion to the incompressibility of the investment.

For impressions the writer puts up a soft-setting plaster, which has about one-tenth to one-fifteenth the expansion of plaster of Paris—virtually none. From

theoretical considerations, however, he favors the use of wax or modeling composition for taking the impression, because their slight contraction yields a plate a little smaller than the surface to be fitted, which is beneficial in all except the very hard mouth.

Having thus pointed out the defects of plaster of Paris, and provided a remedy, the writer believes that he may with pardonable vanity claim to have done for *adaptation* that which Dr. Bonwill did for *articulation*—solved its problem and reduced it to a science.

ARTICULATION AND ARTICULATORS.

By T. A. GORMLY, D.D.S., Mt. Vernon, Iowa.

(Read before the Iowa State Dental Society, at its annual meeting, Des Moines, May 6, 1902.)

THE term "articulation" is usually applied to the arrangement and contact of the bones at their approximating ends where motion is secured. It is also applied to the movement and contact of the teeth in their normal function—and rightly too, for their various movements can only occur through the medium of the articulating surfaces of the condyles of the inferior maxillary in the glenoid fossa or while gliding over the *eminentia articularis*.

Articulation is a word of action and applies to any possible motion or contact of the jaws and teeth. Occlusion (from *occludere*, to shut up)—closure—on the other hand is a passive term, and applies only to the teeth in a state of rest. For illustration, a set of teeth set up and arranged on a common articulator may have excellent occlusion but exceedingly poor articulation. The feature of special interest with which we as a profession are concerned is the relation of the jaws and teeth to each other, and more especially with regard to those substitutes which we are putting in the mouths of our patients and which often turn out unsatisfactory owing to defective articulation. Grinding is usually resorted to for correction of the difficulty if the dentist succeeds in locating the trouble, which is somewhat problematical. We often find the teeth on a full upper and lower set ground absolutely flat from molar to molar in the effort to correct a

faulty articulation. It is safe to say that had a proper articulator been used and the operator been possessed of some of the principles affecting the relation of the teeth in normal contact while in motion and at rest, no such procedure would have been necessary.

The research of the late Dr. Bonwill shed much light on this subject, and the invention of his anatomical articulator permitted a far more natural and practical arrangement of artificial sets than had been heretofore done with the aid of the older forms, which allowed of no motion save that of a pair of hinges which bore little or no relation to the motion of the mandible. Patients were commonly instructed to bite straight up and not swing the jaw, as that would invariably cause the plate to drop, the cusps on one side striking as the jaw rotated while the other side perhaps was not in contact. With the old form of articulator it was impossible to foresee just where the teeth would meet when away from the position for occlusion.

ANATOMY AND FUNCTIONS OF THE JAW.

In order to comprehend and secure true articulation of the artificial teeth we must study the anatomy of the jaw and its functions. The inferior maxillary is classed by anatomists under the head of movable joints, and is given the name *amphidiarthrosis*, or a combined action of the *arthrodia* and *ginglymus* or

hinge joint. The ovoid head of the condyloid process of the inferior maxillary bone articulates with the anterior portion of the glenoid fossa of the temporal bone. Between the bones lies the inter-articular fibro-cartilage, held in place by its attachment to the capsular ligament, the external lateral ligament, and the tendon of the external pterygoid muscle, and lubricated by two synovial membranes, one above and the other below the inter-articular fibro-cartilage. This cartilage is applied in the antero-posterior movements of the jaw over the eminentia articularis, thus providing a lubricated concave track or groove for the excursions of the condyle. It is also important in the lateral movements of the jaw in which one of the condyles remains in the glenoid fossa and undergoes slight rotation during the function of mastication.

We find from twenty-eight to thirty-two teeth in the human jaw, so arranged that no two strike directly upon each other. I speak with reference to normal articulation, for we find in many cases a perverted condition caused by what is termed "jumping the bite," where one tooth stands opposed to another. This abnormal condition is more commonly caused by extraction than in any other way, and more particularly by the extraction of the lower first molars, the usual result being the forward tipping of the second and third molars at an angle of thirty to seventy-five degrees, the distal cusps of these two teeth then occluding with the mesial cusps of the upper second and third molars, the malocclusion being still further increased by a forward or prognathic movement of the mandible in order to acquire a more stable and suitable masticating surface. The inclined surfaces of these lower molars also are a great disadvantage in articulating a full upper set, the usual difficulty in such cases being the crowding forward and dislodging of the plate.

This normal antagonism of one tooth against two is important in the natural denture, and is even necessary with artificial dentures to avoid the migration or

forward movement of the condyles in the glenoid fossæ. I have seen a few cases where this has occurred. This arrangement is also important with reference to the function of mastication. During the lateral motion of the jaw, the teeth on one side glide over each other linguo-buccally, while on the opposite side the motion is postero-anteriorly, this being reversed when the jaw returns to its normal position, the return stroke being most effective in mastication—*i.e.* on the side on which the condyle remains in the glenoid fossa, and the movement of the teeth is bucco-lingually.

By watching a cow chew the cud one can readily observe the movements of the jaw which go to effect the comminution of the food, and which are similar to those already described.

IMPORTANCE OF CORRECT ARTICULATION.

Dr. L. P. Haskell, one of the first authorities on prosthetics, says that correct articulation is of the first importance. It should, then, be the aim of the prosthodontist to produce an arrangement of the teeth of the denture which will conform to the principles of articulation. Having done so, the results will be a source of satisfaction to both patient and operator, and fewer failures will be heard of in the realms of plate work. Bonwill's theory of the jaw representing an equilateral triangle was good as far as it goes, but it can have no application to the form of the jaws of the rodentia or herbivora, whose powers of mastication are equally good with that of man but whose teeth are not subject to the irregularities developed in the human family. His articulator, while a great stride in advance and not to be compared with anything produced contemporaneously in that line, is lacking in this respect. It is based on a general average. All jaws are not made after the same pattern, and do not conform to an exact measurement of four inches between the condyles. When we want to reach a correct result in any particular instance, we do not begin with a general average, but seek for an exact and definite basis for our calculations; and so, in

making a set of teeth, to reach correct results we must begin with exact measurements.

Take, for example, a jaw of greater dimension than four inches. A set of teeth arranged on the latter basis cannot be exactly correct, for the reason that the larger one moves in a larger arc of a circle in what is termed a rotary or lateral movement of the mandible, while a smaller jaw would of course describe a lesser arc.

Then there is another class of cases where it is important that the models be placed on the articulator in precisely the same position with relation to the condyles, as in lengthening or shortening the bite, and in the construction of interdental splints. If the models have not been placed correctly—*i. e.* they have been placed too far posteriorly or too far anteriorly from the center of motion—the teeth will fail to occlude properly when placed in the mouth, and the interdental splint will fit either jaw, but when placed between them the bearing comes on the molars.

The question may be asked, Has an articulator been produced yet which will give all the motions of the mandible and have a universal adaptation to any size of jaw?

To this I would reply, that I believe we have in the Gritman articulator, in conjunction with the Snow face-bow, such an apparatus. We have in its joints a duplication of the temporo-maxillary articulation by which we may obtain every natural movement of the jaw; and by the use of the Snow face-bow we can locate the model on the articulator not only the exact distance horizontally from the condyles to the incisive edges of the lower incisors, but the declination of the maxillary ridge and any deviation to right or left from an arbitrary median line. Each case may therefore be made to conform to all variations found in different individuals,—not making the general average suit the individual. It is evident that the models should be so placed on the articulator as to have the same relative position with reference to the center of motion; otherwise the teeth

will fail to articulate properly when placed in the mouth.

In setting up full upper sets of artificial teeth, I would recommend placing the ten upper front teeth first; then try in the mouth to get as natural an expression as possible; then return to the articulator and begin with lower second bicuspid, adding the remaining teeth pair by pair and trying them by the lateral movements of the articulator as in mastication.

The orthodontist cannot afford to ignore this subject in his work, any more than the prosthodontist in his specialty. Should he do so, nothing but failure could result. Dame Nature is stubborn and rebellious when we try to work at variance with her plans, and generally has her own way when we give up the effort to coerce her. Work with her, co-operate in the direction of her forces, and we find that we reach the desired results with much less effort.

I presume more failures have resulted from neglect to give proper attention to the articulation than from any other cause. The regulation of a set of teeth having been accomplished, and due regard having been exercised to secure the proper occlusal contact of the teeth at rest as well as in the various movements of the jaw, we find they are a law unto themselves, because the forces are opposed by contra forces, occlusal planes by other occlusal planes; in other words, the opposing forces are harmonized or balanced so that retrograde movements are impossible. In malocclusion the forces tend to perpetuate the condition and often to intensify it.

ORDER AND ARRANGEMENT IN THE PROCESS OF DENTITION.

In this connection there is a thought which I would like to present with reference to the development and arrangement of the dental arch which seems to me to be the natural one. The osseous bodies of the maxillæ being of a fixed type and constituting the matrices for the teeth, the germs of which are lodged therein like grains of wheat in a drill, a more or less regular arrangement of the

teeth will result, modified of course by the accidents of dentition. Now, keeping this in mind, let me give you an idea advanced by Professor George B. Snow of the University of Buffalo, as to how the teeth assume a normal degree of regularity during the process of eruption. The infant first erupts the incisors, then the first molars, then the canines, and lastly the second molars. In the second dentition the first molar is the first to develop. Next come the incisors. The first molar he regards as the stationary point in the development of the dental arch, and it holds the fort, so to speak, while the deciduous molars are replaced by the bicuspid; then, in order, come the second molars, canines, and third molars. Each as it erupts grows until it meets its antagonists and is guided to final position and held there by the occlusal planes of the antagonizing teeth in contact with part of its surface; the remaining part of the tooth now serves as the guide for the opposing erupting tooth. The fact, then, of each tooth having two antagonists has a very important bearing on the formation of the arch in the first place.

The study of articulation is of value

to the general practitioner along other lines than those already touched upon, and will well repay a careful investigation. While we may say that this is an age of specialties and no one can be successful in trying to cover too large a field of work, we must remember that, to succeed, the specialist must have a broad foundation, a good groundwork for his specialty. The limitations of his field must not be drawn too sharply, for he must constantly go beyond the borders in tracing out this or that manifestation.

The subject of articulation has been accorded but a small share of attention proportionately to its importance to the profession, and I might say that it is entirely ignored by a majority of the profession, who are unaware of the important part it plays in the proper performance of the work by which they are judged by their *clientèle*. Herbert Spencer has said that the knowledge which is of the most worth is that which enables us to do our work better. So we should not be slow to familiarize ourselves with the subject of articulation, which I am sure will enable us to do better work and gain for us greater reputations in our chosen profession.

RECOGNITION OF THE D.D.S. DEGREE BY THE AMERICAN MEDICAL ASSOCIATION.

By EUGENE S. TALBOT, M.D., D.D.S., Chicago, Ill.

IT will be of interest to the dental profession to know that the American Medical Association has recognized the degree of D.D.S. One object of the establishment of the Section on Stomatology in the American Medical Association was to try to place dentistry on an equal standard with other specialties in medicine. The members of the section have labored many years with this idea for a goal. Members of the association have been the warmest friends from the beginning.

The members of the section have as their battle-cry, "By their works ye shall know them," and for each meeting a program has been prepared far above the average dental society program. Subjects have always been chosen of mutual interest to physicians and dentists to the exclusion of dental technique, since there are many dental societies in which subjects pertaining to dentistry proper are discussed.

When the section was first organized, only those holding the M.D. degree

could become members; later, in June 1887, Dr. N. S. Davis, Dr. W. W. Allport, and myself drew up the following:

RESOLVED, That the regular graduate of such dental and oral schools and colleges as require of their students a standard of preliminary or general education and a term of professional study equal to the best class of the medical colleges of this country, and embrace in their curriculum all the fundamental branches of medicine, differing by substituting practical and clinical instruction in dental and oral medicine and surgery, be recognized as members of the regular profession of medicine and eligible to membership in this association, on the same conditions and subject to the same regulations as other members.

While this practically recognized the D.D.S. degree, yet the wording of this resolution was so ambiguous that every year the officers of the section had more or less trouble in admitting members. Thus at Denver, for some reason unknown to the writer, an edict was issued before the meeting that only M.D.'s could become members, and some thirty members were lost to the association. This was unintentional, as it was admitted by the secretary and treasurer after the meeting to have been a mistake.

The section has drifted along under the resolution until 1901, when a new constitution and by-laws were adopted which placed our section at a greater disadvantage. In the meantime the section, by the character of its papers and discussions, had placed itself upon an equal standard with other sections. Nay, more, it has in some respects gone before the other sections. The Section on Stomatology has been frequently cited in the past ten years as a model which other sections, to be successful, might copy—as witnessed by the following remarks by President Billings at New Orleans:

One of the best conducted sections of the association is that of Stomatology. Its efficient secretary has served continuously for sixteen years. This section is threatened with annihilation since the plan for reorganization was adopted. This should be obviated by the adoption of the by-law proposed last year,

which would enable the reputable dentists who have a degree of D.D.S. to become associate members of the association.

Noticing the predicament, and recognizing the high standard of the work of the Section on Stomatology, the association came to the rescue and passed the following resolution through the House of Delegates:

Dental Members.

Dentists who hold the degree of D.D.S. from a reputable dental college and who are members of a recognized local or state dental society may be admitted as dental members on recommendation of the officers of the Section on Stomatology and approval by a majority vote of the section, the names of such members to be sent to the Secretary by the secretary of the section.

(BY-LAW.)

Dental members shall enjoy the same privileges as regular members and be subject to the same conditions.

DENTAL AND MEDICAL GRADUATES ON AN EQUALITY.

It will be seen that not only is the graduate of dentistry placed on an equal standard with the graduate of medicine, but the association has given the Section on Stomatology great privileges as well. It has given it its own autonomy. This relieves the officers of the general body, as well as those of the section, of some of the annoyance which naturally occurred under the old *régime*. The D.D.S. pays his five dollars and receives the weekly *Journal* of the association, which every practitioner of dentistry or medicine should take.

It has been claimed by some dentists that the medical profession has been hostile to dentistry. While it is possible that such may be the case in certain localities and with certain individuals, it is not true of the members of the American Medical Association. When the section was established at Richmond, Virginia, in 1881, Drs. Samuel D. Gross of Philadelphia, Sayre of New York, N. S. Davis of Chicago, and Toner of Washington were heartily in sympathy with the movement and took active interest

in its welfare from the start. Later, Dr. Marcy of Boston not only worked for its interest, but read papers before the section. It is a well-known fact that these men are all ex-presidents of the association. The dental profession has no better champions than the present temporary and permanent officers of the association.

The secretaries from the start have always stood by the Section on Stomatology. Dr. Simmons, the present permanent secretary, has championed our cause throughout the present trouble. He is a warm friend of the section, and always speaks in the highest terms of our work. I think it safe to say there is not a member in the association who would not gladly read a paper before our section upon invitation. We have had many such papers in the past. There has never been the slightest distinction made between the sections. The Section on

Stomatology has as much influence as any other section.

It has been the aim of the section to elevate the standard of dental education, and its influence has been felt in universities, in the advancement of their years of study, preliminary education, and groundwork in medical principles, as well as in the passing of the Army Dental Bill and the establishment of the Army Dental Corps.

Our numbers have not been large as compared with other national bodies. As compared with other sections in the national body, with the exception of possibly three, we stand very favorably. There is one great advantage, however, in this: When one reads a paper before the Section on Stomatology, upon any subject, he is sure of an appreciative audience. Every person in the room is capable of discussing these papers to the fullest extent.

FACIAL NEURALGIA.

By W. A. FISHBURN, D.D.S., Ellensburg, Wash.

(Read before the Washington State Dental Society, Tacoma, May 23, 1902.)

NEURALGIA is a term often applied in rather a loose manner to describe pains the origin of which is not clearly traceable. It is a disease of the nervous sensory apparatus, marked by paroxysmal pain, which is usually unilateral and in the course of nerves. In many cases no evidence of change in the nerve or nerve-center is discoverable, and to these the term neuralgia is perhaps more properly applied.

It is a disease of middle life, rarely occurring in old age and rarely in children except in cases of delayed and irregular eruption or crowding of the permanent teeth. In these circumstances it may be accompanied by epileptic convulsions. It occurs more frequently in women than men, and more frequently in cold, damp climates than in warm, dry localities.

Heredity plays an important part in producing it, and such diseases as rheumatism, anemia, malaria, and gout, or anything that tends to lower the general nerve tone. Exposure to cold may bring on an attack in those predisposed, as may reflex irritations from the eye, abdominal organs, teeth, etc.

NEURALGIA OF DENTAL ORIGIN.

From a dental standpoint it may be caused by—

First, *exposed dentin*. While cavities are yet quite small they often cause reflex pains; in fact, small cavities seem more prone to produce neuralgia than larger ones, because when a cavity has proceeded to any depth we get more direct pains and more response to thermal changes. Abraded surfaces may produce neuralgia, as may the exposed necks of

teeth, this having been proved by cauterizing the exposed dentin, with the disappearance of pain.

Second, *pulp diseases*. It seems to be characteristic of all pulp diseases for the pain to be referred to a different spot or area than its origin, especially in patients of neuralgic tendency. But, as Dr. Black has said, "The general rule is that the more chronic and profound degenerative diseases of the pulp are much more liable to give rise to distant reflex pains than are the acute cases."

In cases of acute hyperemia, or acute inflammation of the pulp, the pain is usually direct, but in cases of venous hyperemia, pulp-nodules, chronic inflammation or degeneration of the pulp, the pains may be distant and their origin very hard to determine. This is especially true of pulp-nodules and degeneration of the pulp. Two cases will be described that have come under my observation.

A gentleman of about middle age presented himself, suffering from a slight neuralgia on the left side of the face. After a careful examination of the teeth on that side nothing wrong could be found, except a small cavity in the upper first molar. The pulp was alive and the tooth slightly tender on pressure. The contents of the cavity were removed without making an exposure, but the outcome being a little doubtful, the cavity was filled temporarily with cement, an antifebrile given for temporary relief, with the advice to report at the end of a week. In two days he returned having experienced no relief. The pulp-chamber was thereupon opened and found to be almost full of pulp-nodules. As many of these were removed as possible, and access gained to the live pulp, which was devitalized. In removing the pulp from the root-canals more pulp-nodules were found. Shortly after arsenic had been applied the neuralgia left him and has not returned.

The second case was degeneration of the pulp. A lady of about thirty-five applied for treatment at the request of her physician. She had neuralgia on the right side of the face extending to and involving the temporal and frontal

regions, but the pain seemed to center and be most severe in the right eye, to relieve which she wore a handkerchief around her head to cover the eye, saying that the pain was much more severe when she attempted to use the eye in any way. The first impression was that the lesion was not of dental origin, but nothing was said as to this and an examination of the teeth was made. A large cavity in the upper right canine was found, in which was an exposed though partially dead pulp. The pulp was removed with the aid of cocain and pressure anesthesia, with almost immediate relief.

Neuralgia may be caused by diseases of the pericementum. The pains are then usually located in the affected tooth, but in cases where hyperemia or inflammation are not present the tooth may not be tender to percussion and yet may cause neuralgia, this having been proved by the extraction of the tooth and the disappearance of pain. The roots of such teeth usually show hypercementosis or resorption. In cases of hypercementosis, pressure upon the nerves of the cementum by the hypertrophic growth is supposed to be the cause of irritation. Flagg says many varieties of trifacial neuralgia and functional disorders of the eye and ear are caused by hypercementoses.

Impacted teeth often cause neuralgia. This is especially true of the lower third molar, not only because it is the one most frequently impacted, but because of the anatomical relation of its roots with the inferior dental nerve.

In the treatment of neuralgia, if from a dental source, the location and removal of the apparent cause is indicated; yet often this does not give immediate relief. In such an event, temporary relief may be sought by the application of proper drugs, externally and internally, or both. Quinin may be prescribed, two or three grains every six hours; anti-kamnia, or ammonol. Electricity has been spoken of very highly by some as a means of relieving neuralgia, and it is also effective in locating its origin when from a tooth.

THE COLLEGE MAN.

By C. L. GODDARD, D.D.S., San Francisco, Cal.,

FORMERLY DEAN OF THE DENTAL DEPARTMENT OF THE UNIVERSITY OF CALIFORNIA.

IN the DENTAL COSMOS of April 1903 there are two articles on the above subject, one a paper by Arthur Holbrook, D.D.S., of Milwaukee, under the title "Qualifications for Practice," and the other an editorial by Dr. Edward C. Kirk, under the same title.

Dr. Holbrook, after referring to a paper read by him three years ago, in which he had "called attention to the fact that dental colleges were not giving practical encouragement to a preliminary preparation or training beyond the required two years in a high school" (now three years in the case of some colleges, and in 1904 to be four years) says that to-day, notwithstanding the increase in entrance requirements, the condition animadverted upon continues, and that "no material credit is given to a college man."

In other words, he claims, and rightly too, that a student entering dental college with two (or three, or four) years of high-school work, and one who enters after a four years' college course (literary or classical) are both put on the same basis, for both must spend the same length of time in dental college before receiving the professional degree. He claims, and justly, that this is not right, and that the college man should be encouraged by a time allowance in the dental course.

Dr. Kirk claims that a high-school course is a sufficient preparation for the dental course, and that a college course, while desirable on general principles, is neither essential nor important, and that no time allowance should be made for it in the dental course.

Both are right and both are wrong.

A high-school course is a good preparation for the study of dentistry, just as it is a good preparation for the study of medicine or law, or for a literary, classi-

cal, or scientific course in a college or university; but *a college course is a still better preparation*, because the mind is better trained and the habit of study and observation is more thoroughly formed.

EDUCATION ESSENTIALLY A MEANS TO AN END.

Dr. Kirk says, "We hold that all education is essentially a means to an end, and therefore that the amount of time and energy necessary to the attainment of a degree in arts or letters at the termination of the college course, so far as its value as a preparation for the study of dentistry is concerned, is time and energy almost wholly wasted unless the kind of college course upon which the degree in arts or letters has been acquired is one so selected as to its character as to be in line with dental professional training and adapted to the development of those qualities of mind which will be called into requisition in successful dental practice. When the college training is so adapted, and when the collegiate degree represents the completion of a preparatory course which is literally preparatory to the better understanding of the dental professional course, then, and not until then, do we believe the pursuit of such a college course would be conservative of the best educational ends."

We can show that such a time has already arrived, for there are college courses for general culture, pursued by many young men, that are not only *directly preparatory to the dental course*, but even duplicate it in many subjects. Such a one is the course in natural science, for which a time allowance should be made in the dental course.

The course in arts leads to the degree of B.A., the course in letters to B.L., and the course in science to B.S. All

these courses take the same length of time and thoroughness of study. The B.S. is just as valuable as the B.A. or B.L. and gives a much wider range of choice in subjects.

The first idea of a college course leading to any of these degrees is general culture. Many of the studies of this course are not only valuable for general culture, but are equally valuable for special culture or as a preparation for a professional course.

A PRACTICAL EXAMPLE.

I presume university courses are very much alike in the United States, but I can only quote from the University of California, which has three colleges of general culture: the college of letters, leading to the degree of A.B., the college of social science, leading to the degree of B.L., and the college of natural science, leading to the degree of B.S. Besides these there are the several special courses of commerce, agriculture, mechanics, mining, civil engineering, and chemistry, leading to the degree of B.S.

The preparation for the first three may be the same, a four years' high-school course, including mathematics, English, history, Latin, physics, etc., or it may vary in the amount of Latin, Greek, modern languages, chemistry, botany, zoölogy, etc. It is an equally good preparation for the study of dentistry.

The college course in natural science is attractive in the variety that it offers—courses that are interesting in themselves, useful as general culture, and equally useful as preparation for special professional courses. A student, with other studies, may take the following: Chemistry—three hours of lectures, and six to nine hours of laboratory each week for two years or more. Physics—Two hours of lectures and six hours of laboratory, two years. Zoölogy—Two hours of lectures and six hours of laboratory, one year. Microscopical anatomy—Three hours of lectures and six hours of laboratory, one-half year. Embryology—Lectures, recitations, and laboratory, one-half year. Physiology—Lec-

tures and laboratory, one year. General paleontology, vertebrate paleontology, comparative osteology—One year or more. Bacteriology—Lectures and laboratory, one year. Botany—Lectures, laboratory, and field work, two years or more. The time spent on these different studies may vary according to the purpose for which they are studied.

During the four years' course a student will have more than enough to equal a year in any dental course. The studies may not come in the same order as in a dental course, but are of the same value, and credit should be given for at least one year's work and time on the dental course.

A student with the degree of B.S., or one with the degree of A.B. or B.L., if he has taken such subjects as optionals, should be allowed to enter the second year at least. He may be deficient in general and dental anatomy and in prosthetic and operative technic, but he will be so much in advance of his class in other subjects that he will have plenty of time to make them up. The longer habit of study will also give him an advantage over the high-school student.

If he has had a year of chemistry in a high school and one or two in college he will have more than is given in a dental course. If he has had a year of physics in a high school and one or two in college he will have much more than can be given in a dental course. So also with zoölogy, microscopical anatomy, embryology, physiology, if he chooses it, comparative anatomy, etc.

Most students taking a classical, literary, or scientific course in college take it for general culture and not as a preparation for any special profession. Sooner or later in the minds of these students must arise the question of a life-calling or profession. To such, dentistry offers an honorable and useful profession, fairly remunerative though never leading to wealth, and one that can be practiced in every quarter of the globe. Wherever there is civilized life there is a demand for the service of skilful practitioners.

OUTLOOK FOR COLLEGE MEN IN DENTISTRY.

A four years' professional course, or even a three years' course, is a long way to look forward for one who has just finished a four years' college course. If he looks forward at the beginning of his college course he sees seven or eight years of hard work before him before he can begin his professional life. It is no wonder that we have so few college men in dentistry. It is a long time to look forward, especially if he sees studies of his first course duplicated in his second and knows that he will receive no credit for them. There is a feeling of injustice created that may deter him from either the college or from the professional course.

The college man should be encour-

aged to enter the dental profession, where his numbers are few in comparison with those in medicine and law. There are many problems in dentistry that are not yet solved and which the college man may be able to solve or to help others to solve.

How can this credit be given to the college man without violating the rules of the National Association of Dental Faculties? It should first be done by dental departments of universities. If certain studies have been pursued in the university, what difference does it make in what department they were carried on? Let a dental department give credit for parallel studies taken in other departments, count them as part of the dental course, and admit the student to the second year.

PROCEEDINGS OF SOCIETIES.

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK.

Monthly Meeting, November 1902.

THE First District Dental Society of the State of New York held a regular monthly meeting Tuesday evening, November 11, 1902, at the New York Academy of Medicine, 17 West Forty-third street; the president, Dr. Charles A. DuBois, in the chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. J. GRANT PEASE. There may be some here who have not heard of the method of taking impressions for bridge work which I will describe. After the teeth are ground and space is made for the caps, take pieces of wood and whittle them down flat to fit the interdental space, having them project a little above the crown on each side, and take an impression in plaster. The wood will

come out in the plaster and will show the lines, enabling you to get an accurate fit in a very few minutes by pouring fusible metal.

Dr. E. A. BOGUE, New York city, then presented the subject of the evening, his paper being as follows:

WHY I TREAT THE FIRST PERMANENT MOLAR WITH RESPECT.

The first permanent molar in man makes its appearance just before the time when the temporary teeth are shed, and those first permanent molars are unquestionably designed to sustain the jaws during the process of the shedding of the temporary teeth and the eruption of the rest of the permanent ones; and yet sometimes our professional brethren

seem so anxious to get rid of the first permanent or so-called "sixth-year" molar, that they extract it at that period, with the results that are shown in a cut I handed to Dr. Smith. The young lady was about twelve or thirteen years of age, thin and pale and ill, and the mother wanted to know what was the best thing to do for her child's health. I suggested putting in four artificial teeth. The cut shows where the closure and occlusion were—entirely on the incisor teeth. Yet "The First Permanent Molar" was the subject of a paper read by my respected friend, Dr. Andrieu, before the Dental Section of the Medical Congress in Washington, in which he advocated its removal, on the ground that when the patient came into the hands of the dentist that tooth was almost always very seriously decayed. Well, suppose it is! Do you ever consider in that connection what occlusion means, and the relative importance of the cusps each to the other, in the antagonistic teeth of upper and lower jaws?

If we take a mouth containing thirty-two good teeth and carefully examine it from the posterior side, making the models so that the teeth can be seen from the lingual and posterior aspect, we shall better see what cusping means than from the buccal and labial sides; and we see that the lower molar occludes between the upper molar and the upper bicuspid, touching upon both. If, then, that molar be extracted, I do not need to say to the gentlemen present that the next molars—the second permanent molars—invariably lean forward unless the extraction be practiced at such an early age that they go bodily forward and the development of the jaw ceases, or nearly so.

Nature is our best teacher. If we can get her mind as to what constitutes a perfect denture, and the basis of it, we shall be prepared in any case of imperfection to unite our efforts with hers with a fair degree of success. [Dr. Bogue here exhibited models illustrating certain anatomical facts.]

The anatomical facts are, first, that the jaw continues to grow from infancy

to old age; and secondly, that this elongation is mostly from the posterior side of the second temporary molars backward; also that this elongation depends largely upon the growth of the permanent teeth and their assumption of the proper positions they should occupy; that the growth of the alveolus is also dependent upon the permanent teeth, and from that it will be inferred that the removal of the permanent teeth will prevent the development and growth of the jaw.

For the sake of clearness in considering these questions, I will give some of the results that follow extraction, and will explain those results one after another, in case there are some to whom they are not familiar.

First, then, extraction diminishes the size of the dental arches. When extraction is practiced for purposes of regulation for young people, I think the dentist almost invariably says he extracts the teeth to make room. I once thought that myself, but having had some sad experiences, I began to take impressions and make models, and I found that room was never made. Under no conceivable circumstances could a barrel be made larger if one of the staves were removed, especially if the hoops were driven down. The contraction of the lips is constantly present, and the diminution of the arches will be perfectly evident to any gentleman who will take the trouble to preserve the models of a mouth before and after extraction. I have troubled myself to get quite a number of such models. I have some taken in successive years—running for perhaps eighteen years—of the same person. In every case diminution was present. We therefore do not make room, but we diminish the size of the arches.

Secondly, it straightens some of the lines in those arches, so that the curve in certain places is scarcely perceptible. The child with its temporary teeth has very nearly a straight line, beginning at the incisors and going back. In adults it is very considerably curved. It may seem a work of supererogation to mention that, but not so long ago I

was speaking with an English professional friend, and he said he knew the lines were straight from the cutting edges to the molars. Said he: "I am a man of fifty years of age, and for thirty years I have been publishing books and cuts of the teeth, and were there curves such as you mention, all the artificial teeth would not be made so that the ends touch the table when they are put down." He was dining at my table, so I did not want to dispute too vigorously; but after dinner I took him to the laboratory and showed him sets of thirty-two regular teeth, and with his straightforward honesty he said, "It is pretty hard when a man has been so long engaged in professional work and writing to find that he is entirely wrong at this late day." That was C. Spence Bate, who was shortly before his death president of the British Dental Association.

The molar teeth drop together toward the tongue when extraction has been practiced. It was supposed long ago that if a molar were taken out the front teeth would tip backward. It is supposed now very largely that if a bicuspid be taken out the six front teeth will move backward; but I have never seen such a case, and I doubt very much if any gentleman present has. The back ones come forward. The six front teeth, instead of moving backward, drop inward, diminishing the arch, and the canine teeth approximate each other laterally and move toward the tongue.

And that brings us to the third effect of extraction, which is, that it diminishes the size of the arch of the palate. On this paper I have written down as the fifteenth ill result that the development of the palatal arch is so much interfered with by the extraction of permanent teeth, if the extraction has been early in life, that it becomes difficult to have perfect vocalization, and Patti would not have been heard of if she had lost her first molars at an early age.

When I speak of these cases I refer to what I have seen in my models. Extraction shortens the bite, causes the nose and chin to approximate, causes oftentimes, by the process of overlapping

too much, a wear upon the upper incisors especially that is unpleasant, and causes the next effect very often, which is separation of the upper central incisor teeth. If we ask ourselves why these teeth separate from the extraction of the molars, the question is answered, I think, in this way: that the leaning forward of the grinding teeth above and below causes this closure of the bite, and the peculiar hinge of the lower jaw which you all recognize causes the lower teeth to swing forward almost as much as they swung upward, and the impinging on the upper incisors will bring about the separation of the two central incisors, for which all sorts of remedies have been devised—most of them unsuccessful. I only know of one which is successful; that is, to mechanically hold them in position.

The next effect, as it comes to me, is the exposure of the gums wherever the triturating ends of the teeth are not in contact. It will be remembered that in the past, when this question of making room has been considered, it has been supposed that decay would be prevented if the teeth could be prevented from standing in contact. I think I have heard gentlemen say recently that contact means decay. I do not think that is defensible. I am perfectly willing to admit that the contact of teeth shaped in a certain way is promotive of decay, but it is because the peculiar shape is retentive of food which would cause decay. Mere contact of the teeth, so far as I know, is not promotive of decay. On the contrary, we find in the skulls in museums that the teeth that have lasted the longest and given the most wear are the ones most nearly in contact, and we seldom find decayed spots in those teeth.

Then again, if exposure of the gums be caused by teeth being separated a little, either to avoid decay or to make room, or for other reasons, the exposure prevents thorough mastication, first because the meshing and interdigitation of the cusps is not perfect and the proper grinding cannot take place; secondly, because there are not teeth enough to

do the proper grinding; and thirdly, because the gums are sensitive and are hurt by the contact of hard pieces of food. The meshing which ought to exist in normal healthy conditions is entirely prevented, so that very often cusp strikes cusp. As to how great the movement from the extraction of a single tooth may be, I ask you to look at No. 10 [exhibiting]. That is the mouth of a lady about thirty years of age, who was sent me for regulation of the upper left lateral incisor. In making my model as usual and examining the mouth, I saw at once that the lower left second bicuspid had failed to erupt, so that when the first permanent molar came in it leaned against the first bicuspid, which had gone forward very considerably, and when the upper molar came down—for the eruption of the upper molar is subsequent to that of the lower—it did not mesh properly. Then when the others came in, the meshing was worse. The meshing of these cusps is much better in the mouth, however, than is shown on the picture. The posterior buccal cusp does penetrate between the two anterior cusps of the upper tooth.

I was asked, when that model was brought forward, how I knew that the loss of that bicuspid had caused all that irregularity. My reply was that the extraction of a second bicuspid from the mouth of a lady who is still a patient of mine has caused precisely the same condition to appear upon the right side of the lower jaw which in this lady appeared from the non-eruption of the tooth on the left.

The next result that I notice arising from the extraction of this first molar, and sometimes of other teeth, is that it causes an undue wearing down of the cusps of the teeth, so that I have seen in one or two cases, young people of twenty-eight to thirty-five presenting as much wear upon the cusps and the ends of the teeth as ought to be evidenced after sixty-five years of age. That comes from the fact that the occlusion never can be in accordance with the lines that nature laid down. The cusps strike so nearly end to end that wear is pro-

moted. I do not know that this point needs much dwelling on to be thoroughly understood.

Later, when the teeth shall have assumed the position they are going to occupy throughout life, barring the movement which takes place day by day as we continue to exist and move and eat—when that position is reached and decay comes, those teeth will be found more liable to fracture than they were before.

No. 19A [showing the model] is a case in point. That mouth has lost its second molars. The third molar has come since this was made, and to-day those teeth are broken by the force of occlusion, after very moderate-sized cavities. I do not know how to avoid that breakage, because, although the entire digitation of the cusps of the anterior teeth is all right, the second molars having been removed and the third molars having come down, they occupy a different position from what they should. There is not the proper degree of trituration, and the wearing of those teeth is something marvelous. I only wish you could see the models. And that is not an exceptional case at all, but a regular effect from a given cause.

The next result we find from extraction (and we find it as a constant result) is the greater liability to the deposition of tartar between the teeth.

To refer once more to the effort to make room: The greatest effort when this extraction was most in vogue was to distribute the room equally among all the teeth in the mouth, both front and rear. Of course it is fair to remember that occlusion at that time was very little thought of. It was known to exist, but you did not hear it much spoken of. The effort was sometimes moderately successful to make a limited degree of space between certain teeth above and below, with the result that decay did not attack those teeth that were most widely apart; but there occurred another result that was not looked for, and is not looked for to-day by those who advocate extraction—that is, the crowding together of adjoining teeth, which would not have been so crowded had extraction

not taken place. The moment the antagonism is withdrawn between upper and lower teeth, the tooth which has lost its antagonist begins to lengthen. Then there is an occlusion which drives the teeth forward or backward, according to position. If it is driven forward it is driven against its neighbor. If backward, its neighbor is driven against it.

It is far greater than you ever find when teeth are in their normal, natural position. I think I have never seen a mouth containing thirty-two good teeth in which I could not easily pass the floss between all the teeth in the mouth; but we have all seen teeth crowded so tightly that floss would not pass, and when we examine it we find there has been extraction at some point or other in the mouth.

The next effect is that the normal support is withdrawn. This support originally constituted the arch, which is sustained not only by its own members, but by the opposing members of the occluding jaw. When that arch is sustained, the powers of mastication are at their best. I referred in an article to the powers of mastication of the baby teeth, and alluded to the mixing-up with a spatula upon the marble, likening it to the straight lines of the deciduous teeth as they hit against each other. Of course, hard fibrous food is not required in extreme infancy, and is mostly not given to very young children—certainly not in the highest civilization; but as the permanent teeth erupt there comes harder food. We need the arches of the jaw, the one concave and the other convex, in which to masticate food, as much as the mortar needs the pestle. A straight line in the jaws will not accomplish that mastication. All of you have noticed the operation of artificial teeth made on straight lines. While it is the dental depot way of making artificial teeth to make them so they shall occlude on straight lines, or nearly so, it is not on nature's lines; but as you can only put in twenty-eight artificial teeth, you come nearer to the condition of childhood, and the force of mastication is not greater than a good strong child of twelve would use. You never find thor-

ough mastication with artificial teeth; that is an impossibility.

The next effect caused by extraction is the rotation upon their own axes of the teeth posterior to the extraction, which unfits them to proper occlusion with their antagonists, making it impossible to make an artificial antagonist that will perfectly occlude. The posterior teeth lean forward so much after extraction that it is exceedingly awkward and is conducive to the deposit of food and therefore to decay. It is also conducive to the deposit of tartar, and I think I am within bounds when I say that the worst cases of tartar have not been where the thirty-two teeth remain in the mouth.

Finally it diminishes the needed room for the tongue to such an extent that speech is often impaired; it generally becomes much less distinct than it would otherwise have been, and the patient sometimes complains of lack of room. Not long ago a poor unfortunate boy presented, who had an upper and lower bicuspid extracted, and on that side there was extreme irregularity. The relatives were not satisfied with my advice and took him elsewhere, and the teeth on the other side were extracted. He was then brought back to me for regulation. You may imagine with what feelings I viewed the sad remains. The teeth were finally brought into occlusion. The young man can never have the proper articulation, or give pleasure to those who hear him speak.

Discussion.

Dr. WM. CARR. Are there any conditions where you would extract a first or second permanent molar between the age of say eight years and twenty-one? What are the conditions that would call for extraction?

Dr. BOGUE. I deeply feel the importance of Dr. Carr's question. I cannot help calling to mind two things: One is a moment when just such a question was asked me in the lecture room at the Harvard school, where I lectured. It must have been a sort of inspiration—it certainly was beyond my ability to answer the young gentleman who asked

me this question—when I said: “the extraction of a tooth is the acknowledgment of our incompetency to save it.”

I also remember the incident of a young girl of sixteen, whose case I have mentioned so often that I think you all know it; whose lower left first molar was abscessed and badly decayed. The right molar was not much better off. One of the upper molars had an exposed pulp; the other was badly decayed. I treated those abscesses and they got well. I put screws into the roots, put a ring around the left molar roots, a little gutta-percha over the gum, and filled that ring with amalgam. The right one was almost similarly treated with a gold ring. That young woman improved in health and weight and behaved very much as when adenoids are removed. She has gone to a remote part of Russia with her husband, a distinguished official. The results gratified me, but what I did would, I suppose, have been condemned by most of my professional brethren. I kept the teeth in occlusion so that they could masticate, something which they did not do before.

I mention this from my personal standpoint, which Dr. Carr will, of course, forgive. If he were to ask what I would do in hospital practice: I do not know. I would conceive that there might be cases where, looking on every side, it might be worth while to extract. For myself, I have not done that. In sixteen or eighteen years I have extracted five good, strong teeth; three of those were lower impacted molars. I do not always take those out, either. Another tooth I took out was a right lateral incisor for a young woman thirty years of age. There are occasions on which we must take them out; but I should still feel like saving teeth, even for hospital patients, if I could; and if the worst came to the worst, by the destruction of the pulp. I should feel like saving the remnants of the teeth so as to prevent the pushing forward and the destruction of occlusion, which to me is one of the most important things which we, as dental surgeons, have to deal with.

Dr. CARR. Those teeth will become

necrotic; what will become of them then?

Dr. BOGUE. I think those teeth will stand. She will be so far away from dental services that she cannot get at them. I do not think she can get anyone to extract them. I think those roots, being filled with zinc oxychlorid, which is my pet filling, will last; and I may be pardoned for digressing by saying that Dr. Jenkins said that he had noticed for many years that when teeth come to him broken off, as they often do—he is practicing in Dresden—that he always found the teeth whose roots were filled with zinc oxychlorid were susceptible of immediate treatment for pivot teeth, or otherwise; but those filled with gutta-percha or other substances he had to stop and treat, and fill when he could. In my case, the roots are filled with zinc oxychlorid, and if the crowns break off the roots would still be in a healthy condition; and as I have seen teeth twenty-five or thirty or more years after filling—pulpless teeth—still in good condition, I have hopes they will last some time yet.

You will kindly understand in this instance that I am not talking to a miscellaneous crowd. I am talking to gentlemen who if they do not know all there is in dentistry, are bound to learn all they can. If the question should become a practical one, I am not able to answer it; but while it remains theoretical, and we are discussing as to what is the utmost that science and art can accomplish—that is what I am trying to answer.

Dr. CARR. We are dealing with practical cases every day. You are a strong advocate of this thing. Suppose a patient comes to you in not very good health, with poorly developed teeth—premature decay; take the first permanent molars with exposed pulps. How would you treat that case, and what would you expect? These things come to us almost daily. How would you handle such a one? Let us suppose the patient is from ten to fourteen years of age and has about twenty-five or thirty approximal cavities in the mouth.

Dr. BOGUE. I found in this girl's mouth [showing model] about six or eight cavities in every tooth, and I shall take pleasure in showing you the chart any day you wish. That young lady was a sister to one for whom I took out the four first permanent molars a good many years ago, and I have always regretted taking them out since I began to earnestly study the subject. I said to the mother, "I am absolutely afraid to take out those four first permanent molars, as you want me to do." "Why?" "Because she will lose all her teeth." "How do you make that out?" "Because the second molars will come forward and the occlusion will be very much like your own." "Don't, for mercy's sake, let her have them that way!" "In the next place, if I extract those teeth, the contact of tooth against tooth all around the mouth will be such that no power can keep them clean, and they must decay." "Then," said the mother, "do all you can to save her teeth." She has never had toothache and never lost a tooth, and is now the mother of a family; which means, that notwithstanding the unfortunate condition of the teeth when they came through the gum, defective as they were, it has been possible to keep them. It has been possible only by the combined efforts of the patient, the mother, and your humble servant.

I am perfectly aware that this is not a fair answer; and now I want to find fault with your question, if you will let me. Those teeth came through the gums with defective enamel, as you might readily understand. They came through also with defective forms. I conceive that a perfect set of teeth would be a set that came through in the mouth of a person with such a degree of vigor that, as those teeth were formed, they were rounded; but the physical condition of this girl was such that she had not enough vigor to keep her teeth clean. Her breath was offensive, and remained so until shortly before her marriage—on account of the tartar. There was something in the physical condition of the child that prevented her from keep-

ing her teeth clean; and in the doctrine of the survival of the fittest, which Dr. Darwin has laid down for us, he would mean that the fittest would have the strongest teeth, that the teeth would be rounded, and be self-cleansing, as are the teeth we see in the museums. The teeth Dr. Carr spoke of, in the girl fourteen years old, you find are both malformed and malposed. If we can get them back into their proper position and form, then we give that poor invalid a better chance for mastication than she could have if we took them out and reduced the masticating power still more.

Dr. CARR. What materials did you use for the filling of those teeth you mentioned?

Dr. BOGUE. Everything under the sun. Gutta-percha sometimes, when I could not do otherwise. I had a fight all the way through. The upper left canine was decayed beneath the gum before the tooth was erupted. To-day it has two unfortunate blotches of gold and platinum on the anterior surface. I did not want to go to the trouble of making those fillings of porcelain to replace the original fillings, and the Jenkins process was not yet known. She has a few copper fillings, some tin, some tin and gold, and gold and platinum. As you look at her, the show of glittering gold in front is not unpleasant; those two large spots on the canine are the worst ones.

Dr. NELSON T. SHIELDS. There are two questions I would like to ask Dr. Bogue. The first will be: In the case of a child nine years old, with a large exposed pulp in the first molar—what would you do with that molar? The second: A young man twenty years old; upper first molar, crown entirely decayed off, roots almost separated by decay; the decay between roots of such a nature that the decayed part would break through and bend like paper. The maxillary sinus is dangerously near these roots. The roots are practically separated, only being joined by decay. That tooth can be saved only in one way, and it is questionable in my mind whether it should be resorted to; that way would

be the removal of all the decay, which would positively separate every root. There would have to be three separate foundations made to individualize each root, and the gold band constructing that foundation would have to be made far up into the alveolar process, and I think in that case that the roots had better be extracted. I would like a calm decision, for the benefit of the whole profession, on this identical tooth.

Dr. F. L. FOSSUME. I would like to ask Dr. Bogue's opinion in this case: A boy of twelve years, having large and protruding teeth, all in good condition with the exception of the first molars. These were badly eroded and decayed on the grinding surfaces. They were also sensitive and sometimes painful. The mother brought him to me in order to have his mouth improved in appearance. As there was very little room between the teeth, I had the four first molars removed. I then cemented bands on the second molars, with tubes running antero-posteriorly, through which a band or wire traveled, embracing the front teeth, with screw threads on the ends for nuts to jack it up. The tubes prevented the molars from tipping, and small hooks were soldered to the encircling band, resting against the cutting edges of the incisors so as to prevent the band from slipping up on the gum.

The appearance of the boy's mouth is much improved, but the occlusion is not as good as might be. I have thought that it might have been better had I extracted the first bicuspid and fixed up the molars.

Dr. H. D. HATCH. Dr. Bogue said that he was not addressing a miscellaneous crowd, and before that we were told that he was to come here and talk to the "first-year men on the back row"—all of which makes me think of what I have very often thought in this little room, that the man who speaks at all here, whether he reads a paper or discusses it, does address a very miscellaneous crowd, and a very great crowd. He addresses the whole English-speaking dental world. Our proceedings are published in the *Cosmos*, as you all know. The journal

is spread broadcast, and what is said here in an ordinary conversational tone is read all over the world. Now, what class of men change their opinions after reading what is said here? Certainly not the professors in colleges; certainly not the men who have been forty or fifty years in practice. Those men would not change their opinions no matter what took place. The men who change their opinions and therefore their practice as the result of the discussions here and elsewhere are the young men, possibly the first-year students, the new graduates. Most of them are in the country—men who have not the facilities and privileges we have. They get their dental pabulum or knowledge from the journals.

Not a great while ago we heard in this room a paper of the late Dr. Tenison's read by our secretary. It was just the opposite to what we have heard to-night. Shortly before that there was published in the *Cosmos* a paper along the same lines by Dr. Mitchell, condemning the first molar and advocating its extraction. To-night we have Dr. Bogue's able paper. At the time Dr. Tenison's paper was read, able men were here, and whether or not they were influenced by the fact that Dr. Tenison had so recently died I do not know, but the trend of the discussion was rather favorable to his position.

It seems to me that it is time this subject of the first molar was settled. The combined intelligence of the dental world ought to settle a question as plain as this one is. I do not know how men can look at the models which Dr. Bogue shows and not be convinced; on the other hand, the pictures of models presented by Drs. Mitchell and Tenison seemed to carry out their ideas.

Now, if you will pardon me, I brought two models with me: Dr. Bogue has hundreds of them at home, all better than mine. It occurred to me that one of the reasons why Dr. Mitchell's drawings appear to show what he wanted them to show was that the impression is taken in modeling composition or in wax, and then is drawn straight up.

The cast is looked at from the *outside*, and the tipping of the molars does not show. Then, if a picture be made from that, it shows still less. About the only way to get good models is to take them in plaster of Paris and then articulate them so you can look into them from the back. You could hardly see the amount of deformity as well by distending the cheek and looking into the mouth.

There is one point Dr. Bogue has not touched upon. He has raised every point almost except that one, in showing the disastrous effects of the extraction of the first molar. That point is this: that malocclusion or the bringing to bear of force on an axis different from that which nature intended will produce in some cases nerve-irritation reflexes and general nervous manifestations. Dr. G. V. I. Brown brought that out in a paper on "General Nervous Manifestations in Relation to the Jaws and Teeth," read before the American Medical Association at Saratoga last year.

Dr. JOHN I. HART. We as a body lack all the elements of conservatism; and if, as a result of the excellent paper we have heard to-night, we become more conservative, then I think Dr. Bogue has done us a very great service. Dr. Bogue has almost eliminated from consideration any thought on the extraction of more than one or two of the first molars, and I think that many of us have seen cases that have been markedly improved, where the first molars have been removed. If I may be permitted to cite a case of my own, I would refer to a family of patients whom I have attended for a period of seventeen years, and with four or five of those patients I have been very much dissatisfied with the results I have achieved. They presented the softer elements of teeth, and work did not stand as it should. In the mouth of a younger sister of this family I thought better results could be obtained with twenty-eight healthy teeth than with thirty-two of the character of those that had resulted in the mouths of her sisters and brothers. After the second molars had erupted sufficiently, so that they oc-

cluded, I had the first molars removed, and it is the only mouth in that family that I have had any satisfaction in treating. Do not suppose I am going to have the four first molars in every mouth removed haphazard; but in that instance, working on the experience I had with other members of the family, I got very satisfactory results.

The model shown by Dr. Bogue is interesting; but I have seen a retained temporary second molar that has occluded with the upper teeth just as well as the permanent teeth in the mouth; so that I would not consider this case typical.

I want to ask Dr. Bogue whether he does not consider that there is a tendency in this very mouth for the bicuspid to approach each other, and that the irregularity he referred to is not due entirely to the loss of this temporary tooth before its time. I infer from the condition on the other side that this is probably accidental, rather than acquired through this particular extraction or loss of the tooth. The tooth was lost, and you assume that this irregularity was due to its loss. There seems to be a tendency where no tooth was lost, toward the same condition.

Dr. BOGUE. The tooth on the other side is also lost. It fell out.

Dr. HATCH. Dr. Carr asked Dr. Bogue what he filled those poor molars with. Since the introduction by Dr. Ames of his oxyphosphate of copper I have had splendid results from its use, especially in those cases where the teeth present have their usual form, except that the enamel is gone, the dentin soft and very tender, with often no well-defined cavity of decay in which to put gutta-percha or other filling.

Without making undercuts, I coat the whole surface with the oxyphosphate of copper, leaving it there for several years, until the dentin is harder and the pulp smaller, when a more esthetic operation may be done.

Dr. F. MILTON SMITH. Since Dr. Bogue has called me to my feet, possibly he will permit me to try to answer one of Dr. Shields' questions. Had I the

skill of Dr. Shields in the working of gold, I should try to save that particular molar in the case of the older patient. In the case that Dr. Carr mentioned, where decay progressed so rapidly, Dr. Bogue said he used gutta-percha where he could not do better. At least I understood the doctor to say that.

Dr. BOGUE. I said where the teeth were in process of eruption.

Dr. SMITH. Possibly most of us will do no better than use gutta-percha in such cases. Regarding the extraction of the four first molars, I am exceedingly grateful that a dozen years ago I did not give way to a very strong temptation along that line. Dr. Hart has observed one case where the extraction of the four teeth seemed to work good results. I have a family in my practice whose teeth I have had the care of for many years. The eldest daughter, when she came to be about nine years of age, had one of the lower first molars badly decayed, and the other teeth were decaying quite rapidly. Approximal cavities came in the incisors almost as soon as they got through. I was strongly tempted to extract the first molars, but did not. To-day I have a patient who has thirty-two good teeth in the mouth, who never has had toothache. She is now twenty-two years old, has only a moderate amount of decay each year, and her mouth is one of the prettiest in my practice, barring the amount of early decay that occurred.

A little later on, her brother came to me with his teeth decaying rapidly. I am not positive whether I extracted all the first molars, but I think I took out two bicuspid, and in the lower jaw the molars. I cannot see that I prevented the decay at all, and I have injured that boy's mouth terribly. Unless I regulate now, enlarging the arch and replacing the lost teeth, he never will speak correctly.

Dr. SHIELDS. I would like Dr. Bogue to state at the close of this discussion, positively, whether he thinks there is no reason for the extraction of a first molar.

Dr. ARTHUR L. SWIFT. One of the questions which frequently confronts the

practitioner is, Will the patient submit to the treatment necessary in cases of advanced decay of several first molars, and is the parent willing to allow the patient to devote the time required for the expansion of the arch and the bringing of the teeth into line? And last but not least comes the question of expense, which often settles the matter. Although the dentist states to the patient his decision that these molars should be preserved, he is met with the statement that the child's time is so occupied already with studies, gymnasium, music, dancing-school, and the like, that he has hardly a spare moment, and how can he devote the large amount of time necessary for arch expansion, etc.? It seems so unwise to many patients to make the effort to save completely broken-down molars. But the question of expense is often the greatest bugbear. I agree most positively with Dr. Bogue as to the theory of the preservation of the first molars. I have advised the extraction of two and of four first molars many times during my practice, but I am convinced that, theoretically speaking, it was always a mistake, and in every instance the result would have been much more satisfactory if the molars could have been retained. Still I shall probably continue occasionally to extract first molars when such cases as I have described come to me.

Dr. BOGUE. I am much pleased to hear Dr. Swift's testimony that much, if not most of our trouble, arises from the lack of time and the supposed lack of money. But that is not what we were discussing to-night, as I understood it; it was the question of the propriety and the desirability of extracting the first molar. It was not the question of economics; it was a higher question than that. I did not mean to touch on the economical side in what I said.

Dr. Smith said the patient for whom he had saved the first permanent molar never had toothache since he took charge of her teeth. The answer I want to make to him is that others have had his experience, and furthermore, that when the teeth have been brought into that

condition, as nearly as possible approximating the ideal shape, position, and occlusion, it is the most durable condition for the human teeth to be in.

Dr. J. G. PALMER. I might say something about Dr. Shields' patient of nine years of age. Dr. Smith has told almost the identical story of what passed through my mind. The oldest of a family of children came to me when she was just eleven, with the two lower first molars devitalized and the upper left first molar with the pulp exposed. The upper right molar was in good condition as far as the pulp was concerned, although there was some little decay. The mother came with the expectation of having at least three of the teeth, if not all four, extracted. I had to argue with her quite a while to do as I pleased, and having gained her permission I treated the three teeth. The young lady has now thirty-two teeth, and the occlusion is as nearly perfect as any I have seen; she is about twenty-six or twenty-seven years old and has had no trouble since the time when I took those teeth in charge.

Her next younger sister (they are people living at some distance from New York) was placed in the care of a gentleman living near them, whom I know very well. He extracted all four of her first molars. The malocclusion in her case is extremely marked. The second molars have come forward, and there is more decay than in the teeth of any of her brothers or sisters.

Dr. BOGUE. Dr. Hart spoke of the extraction of the four molars. The answer to that is, four wrongs do not make one right. I want to say to Dr. Hart, Make a good model of this case—the case which he speaks of—and open it back like the one that was passed around; then make another model of the first patient you can catch—because patients with thirty-two good teeth do not come into our hands every day; then study the cases within and without, and he will get an answer worth a hundred times more than anything I can tell him. Will you do it, Dr. Hart?

Dr. HART. I certainly will.

Dr. BOGUE. Thank you, and I hope you will show it to me.

Another thing that you did not bring up, that I thought you were on the verge of telling us, was this: When cusps shut in this way [illustrating]—and that is the normal condition of cusps—they serve to hold the teeth not only laterally but antero-posteriorly, to hold the two dental arches in position. I am not speaking now of mastication or trituration. Those cusps would not be so high if they were less triturated. A girl was brought to me, to have her teeth regulated, with the cusps all ground away because the dentist who regulated her teeth thought he got them in good position, although they struck on the ends of the cusps; they could not be regulated again with any certainty that they would stay where they were put. The girl for five or six years wore a retaining plate every night, but there were no cusps to give a hold. That is another thing people forget. (This refers to Dr. Fossume.) They forget that children grow up; they forget that when teeth are in the skull at six years they are as big as they will be at sixty, and yet the head is not as big.

Dr. FOSSUME. When that boy was thirteen or fourteen, he had a very broad face and teeth. He was of Irish parentage, and both his father and mother had the same expression. Was it excusable to extract those teeth?

Dr. BOGUE. I have quite a number of times said to a patient: "I cannot do that; it would not be right," and the patient has said, "But I am going to have it done anyway." "Then you will have to go elsewhere." And they have gone elsewhere. I will not do for money what I know to be wrong in my profession; I do things that are not right often enough because I do not know better. For appearances I should not extract, and I should generally later on find myself justified in having kept the teeth.

Dr. FOSSUME. I might say the mother is very much pleased with the way the boy looks now.

Dr. BOGUE. Dr. Hart referred to No. 10 as being not typical. It may be that Dr. Hart has a temporary molar, but I

do not see where he could get it back there.

Dr. HART. I said I had a patient who had a temporary molar in the same situation as that temporary molar, which occluded with the teeth as well as the other teeth did.

Dr. BOGUE. I have seen that too. This one has retained its position. I think this is typical, and the other would not be. The proof is, if you will at any time take jaws that you see in the museums, and measure them, you will see that the adult jaw is a great deal larger from the base of the maxillary to the grinding ends of the teeth, or to the edge of the alveolus.

This matter of extracting, which Dr. Fossume has answered for us, came to me in a different shape once. I sent a little lady to a professional friend for him to slightly renew the fixtures. He was a good way off. Afterward he said to me, "Why were you such a fool as to regulate that girl's teeth? Why didn't you pull out the molars?" "She wouldn't be any better off," said I. "Well, you would get your fee and she would never know the difference."

Another case I sent to London to undergo a treatment for regulating. The mother told the dentist that he must take those two upper bicuspid teeth out. A couple of years later he showed me models of the case. He said the mother still remained with him as a patient, having been greatly satisfied, although the young lady had gone to the Continent. I measured the teeth and the six front ones had not gone back, as he said they had, but the others had come forward. But since the teeth had come out according to the mother's wish, she was perfectly happy. The dentist was surprised to find that the back teeth had come forward and the occlusion was not good.

Dr. FOSSUME. Had he tried to pull the anterior teeth back?

Dr. BOGUE. Yes. The occlusion was spoiled. He never could get it back again.

Dr. SHIELDS wants me to say there is no reason for the extraction of the first

molar. One reason that has been brought up is dollars and cents; another is time.

Dr. SHIELDS. Your whole paper has beautifully illustrated that extraction of the first molars or bicuspid will make quite a serious irregularity. In some cases, however, it is obligatory to extract these molars. I want you to put yourself on record that there is no reason or necessity for the extraction of the first molar.

Dr. BOGUE. It is the same as the removal of eyes, legs, fingers, or toes. It is a bad thing to do, but to say that there is absolutely no reason for it is presumptuous. I have in the last eighteen years had occasion five times to extract teeth. It means, to be sure, that I have chosen my patient; it means, to be sure, that I have never accepted a patient for my operations that did not come well recommended. I do not take every chance comer, and never have done so.

Dr. SHIELDS. Your good patients, who are sent to you, will get into as bad a fix sometimes as the poorer patients. Take the case now of the young man twenty-one years old, a millionaire who will pay any price for your honesty. The upper first molar is decayed. If the decay is all removed, the solid portion of the root will be buried in the alveolar process. To save that tooth you will get a good big fee. If you are honest, your fee may not be so big. In that particular case, with the good occlusion of the rest of the teeth in that young man's mouth, what would you advise doing with the roots of that molar? If you save the tooth, would not the irritation caused in the alveolar process beneath the antrum, and in this case with a large opening at the apex of the palatal root—would not in years to come that antrum be endangered by the saving of those apices of roots, having the bands so deeply buried in the alveolar process? We are waiting for your answer, and your words are going before the world. Personally, I would advise the extraction of the roots of that molar.

Dr. NASH. What is the condition of the rest of those teeth?

Dr. SHIELDS. They are somewhat decayed.

Dr. NASH. It seems to me the matter ought to be so apparent from Dr. Shields' presentation that the honest expression of the inadvisability of attempting to save that tooth ought to come right out.

Dr. SHIELDS. That is what I am talking about. If the tooth should be extracted, we should tell the patient so. I want Dr. Bogue to make some admission that there are conditions when the first molar must be extracted. He has only spoken of the ills that must come in case we do extract. He makes no admission of any possibility that this tooth ought sometimes to be extracted.

Dr. BOGUE. I will make just as large a list of ills that will come from the amputation of legs. I take it for granted that every gentleman in the room is sufficiently grounded in his profession to say what is right professionally, and is also, I hope, sufficiently grounded in his moral knowledge to say what is best morally; but I am very far from laying down fast rules on given cases, and anyone who tries to answer a hypothetical case will have the ground knocked from under his feet. Dr. Shields, with his skill, cannot give us the exact conditions of the case. He has already given us his answer.

There is one thing I did not say, but you all know it as well as I do, although it is not often spoken of: The first permanent molar has something like six years longer in which to decay than the second permanent molar, and that is perhaps the reason why this particular tooth has been so attacked by the thoughtless, and by those who have not carefully considered all the surroundings which go to make up the reason for any given course of action.

Now I want to say something which is off the subject. One gentleman said this question had been discussed a great deal before dental bodies, but only one side was presented at a time, and no decision arrived at. He says he has seen many cases in which extractions have

been of great benefit, and others in which they have been harmful. One gentleman, Dr. Clowes, since gone to the other world, advocated dental gardening—the extraction of teeth here and there, as you all remember. I sent him by Dr. Ives one day a model, and he declaimed most unstintedly against the man who had done that work. He said he was a quack and a rascal, and one who ought to be sued for malpractice. I said to him afterward: "That case was in your hands until she was twenty-one; she was in Dr. Northrop's hands three years longer, and then she came to me, and we three are responsible for her condition." When she came to Dr. Clowes, he meant to do the right thing, but the passage of years had brought on the condition which he denounced so bitterly.

In regard to the remarks made: Arguments are not facts; and what I have had the honor of presenting to you are facts—dreadfully stubborn things—they were brought to me after much suffering on my part. When I received a splendid present for having done a piece of work so admirably well, I began to wonder whether I had done it admirably well. After I made models and studied it I was compelled to admit that it was not done so well; and after I went to those dentists whom I had previously consulted, and asked whether those teeth should have been extracted and they said Yes, I found that we were all wrong, and they should not have been extracted.

That is what set me to making those models, to find out what was right and what was wrong. These things are not brought out in argumentation, but they are facts, and I hope they may stir some others to make as careful examinations as I was forced to make.

In regard to Dr. Tenison's cases, I have the satisfaction of having them all in my house, and as I look them over, they only confirm me more forcibly in the views I hold.

Dr. HART moved a vote of thanks to the essayist for his interesting essay.

Adjournment.

B. C. NASH, *Secretary*.

CONNECTICUT STATE DENTAL ASSOCIATION.

Thirty-ninth Annual Convention.

TUESDAY—*Morning Session.*

THE thirty-ninth annual convention of the Connecticut State Dental Association was called to order at 10 o'clock Tuesday morning, April 21, 1903, in Unity Hall, Hartford, Conn., with the president, Dr. Edward Eberle, Hartford, in the chair.

Dr. D. W. JOHNSTON, vice-president, having taken the chair, the president read his annual address, as follows:

PRESIDENT'S ADDRESS.

Mr. Chairman, fellow members of the Connecticut State Dental Association, ladies and gentlemen,—In extending to you a most cordial welcome to this, our thirty-ninth annual meeting, I exercise a privilege that affords me much pleasure.

You who for a time have put aside the burden of daily toil that you may be in attendance here during these sessions, I trust will not, when the hour of adjournment has passed, have any cause to regret that you have devoted two days to the interests and welfare of the association, and when you depart to resume your labors may it be with renewed energy and spirit, and with a sense of having fulfilled an obligation you owe alike to yourselves, your fellow members, and those whom you are called upon to serve.

May each of you gather here something that is likely to be of value or benefit to you, some method of treatment, use of an appliance, perchance merely an idea that may enable you to solve a perplexity, supply a deficiency, or a contribution of some kind that may tend to make life's labors more of a pleasure. How swiftly turns the wheel of time! The heat of summer, and the frosts and snows of another winter, accompanied by the vicissitudes of life, have again

passed into history. These dawning years of the new century bespeak a wonderful augury for the future, though it would seem that with billion-dollar combinations, wireless telegraphy, and like achievements, the utopian age had arrived. But no!—the world, and science with it, moves on with such gigantic strides that the most fertile imagination falls far short of the possibilities of the years to come. In the onward march the science of dentistry is no laggard. The extension of the college course to four terms, the increased and growing membership in our societies, the introduction of a corps of dental surgeons in the army, and, along the lines of research, Professor Kirk's microscopical analysis of the saliva as an index to disease, and the work of Williams, Miller, and Black are but examples, and demonstrate that we are not in a state of lethargy.

Less than a decade ago a meeting of over three or four hundred dentists was worthy of considerable note. The fifteenth anniversary of the Odontographic Society of Chicago, attended by over two thousand, and the manufacturers' exhibit held last March in Philadelphia, where five thousand passed through the turnstiles, have caused little more than a ripple on the surface of the rapidly moving panorama of to-day.

The meeting of the International Dental Federation and International Commission of Education in Stockholm last August was attended by men of eminence from the foremost countries of the world. On that occasion Connecticut was represented by our honored Dr. Strang. An all-important subject considered by the Commission at that time was the preliminary education required of the dental student, and the period and arrangement of the curriculum, which consid-

eration by that body was in reality a basal step toward the accomplishment of the very-much-discussed and greatly-to-be-desired unification of dental laws.

It is gratifying to note that the fraudulent diploma mills of Illinois are being gradually but successfully suppressed, and that the regular American graduate will once more receive just recognition in the German empire as well as in other foreign countries.

At the present time there is scarcely a country of importance, or a state or territory, whose statute-books do not contain a law requiring from all who have chosen to enter the profession of dentistry substantial proof as to ability and proper qualifications to practice. Here in our own state, the Dental Commissioners have endeavored to place Connecticut on a high standard, and their efforts are in a large measure successful.

I would impress upon your minds the advantages and pleasures to be derived from membership in the National and Northeastern associations, and urge upon all who have not yet become members a careful consideration of the importance and value of a close relationship to these societies.

Thirty-nine years ago the fifteenth of next September an invitation, signed by James McManus and Leroy D. Pelton as a committee, was sent to every dentist in this state to meet and assist in organizing a state dental society. The following is an extract from that invitation: "That *esprit de corps* which is the soul of a professional body has forever had a hard struggle to exist (if it existed at all) among the dentists of Connecticut." What a contrast when compared with the condition of growth, harmony, and prosperity pervading our association to-day!—an example of the development of good works in the land of steady habits, slow but sure.

As individuals, has our advancement been commensurate with our experience? How often do we profit by our failures? Measured by the standard of progress our daily life is but a series of successes and failures in proportion to the skill we possess in a greater or lesser degree,

sound business judgment, and a clear conscience.

The restoration of the incisal angle with an open-face gold crown may seem to be a success in so far as the crown is concerned, but such practice savors strongly of an easy method of obtaining the fee, and therefore cannot be seriously claimed to be a success. It has been said that the alluring crown and bridge has proved to be the best graft, using the word of to-day, that the profession has ever witnessed—though it cannot be denied that the advent of crown work opened a new era, since which comparatively few teeth need be consigned to the forceps.

Porcelain for inlays has many supporters and is gaining ground. Although with the present methods of procedure a sharp discrimination in its use is essential on the part of an operator not thoroughly skilled in the ceramic art to insure permanence, still the beautiful results attained by Jenkins, Head, Capon, and others are a tempting incentive to many practitioners to venture.

I would suggest for your consideration, not necessarily to be acted upon at this time, but as food for reflection, that some means be devised, in one way or another, toward teaching the children in our public schools the importance of oral hygiene and the proper care of the dental organs.

Furthermore, the establishment of a free dental dispensary, under the auspices of our association, or of local dental societies—which I believe to be one of the probabilities of the near future—would be a commendable project and a most beneficent work of charity.

I avail myself of this occasion to invite your attention to the fact that a large amount of work on the part of several of your executive officers is necessary to conduct our sessions as they are being held to-day. Some of our active workers have proposed that as a means of partially relieving the secretary and the executive committee of their arduous labors and duties, a committee be added, to be styled and known as the "Program Committee," which shall be charged

with the preparation of the annual list of papers and clinics. The proposition seems to be a good one, and I am heartily in sympathy with the idea as one worthy of favorable consideration.

Several years' experience as your secretary and a practical knowledge of the duties incumbent upon him who fills that position, prompt me to suggest to you the advisability and propriety of the payment of a suitable compensation to the secretary and also to the treasurer, and that such compensation be provided for, either by an amendment of our by-laws or by resolution from year to year.

In conclusion, I desire to express my appreciation of the assistance I have received from many in the discharge of my duties as your presiding officer during the past year. I trust the work and deliberations of this convention may be productive of good and satisfactory results, and pledge my hearty co-operation in all that you may undertake to do for the best interests of our association.

Let us strive for ideals founded upon honesty of purpose, and ever keeping those ideals before us meet duty unflinchingly, to the end that the sunset of our earthly existence may be radiant with recollections of a life well spent and with a hope of reward that is in the life to come.

On motion the address was referred to a committee of three to be appointed by the chair to report on the president's address later in the session.

Dr. Johnston appointed Drs. Strang, Metcalf, and James McManus as members of that committee.

Dr. STRANG. Before the reading of any papers, I would like to make report for the committee to draft resolutions on the death of Dr. Barker. This committee was appointed last year, but so late in the session that we did not have time to make a report during the last session. Dr. Strang then read the following resolutions:

Died November 30, 1901, Dr. CHARLES COFFIN BARKER, aged sixty-three years.

WHEREAS, It has pleased an all-wise Heavenly Father to remove from the sphere of

his activities to the "mysterious beyond" our friend and fellow-worker, Dr. Charles C. Barker, we desire to give expression to our sense of the loss our profession has sustained in the taking from our ranks one who for many years labored, ever ready to maintain its dignity and honor; therefore be it

Resolved, That in his death this association loses one of its valued and trusted counselors, a faithful and efficient worker. The dental profession loses a member who by his high character and skill, and his dignified and courteous bearing, commanded the admiration and respect of all his associates.

(Signed) CLINTON W. STRANG,
JAMES McMANUS,
CIVILIAN FONES,
Committee.

On motion it was decided that the resolutions be spread upon the records and a copy sent to the family of Dr. Barker.

The society then listened to a paper from R. A. McDONNELL, M.D., New Haven, Conn., as follows:

SKIN DISEASES OF INTEREST TO DENTISTS.

Through the courtesy of the New Haven Dental Club, the writer was invited last winter to read a paper on the above subject, which elicited a very interesting discussion. One gentleman, who had practiced dentistry for upwards of forty years, stated that never in that time had he known of a single case of contagion occurring in a dentist's office. Another gentleman, evidently assuming that my paper was an ill-natured attack upon dentists in general, called attention to some of the unsanitary practices of physicians, and challenged the writer to defend them. But it is with an entirely different purpose that attention is called to the possibility of various contagious diseases of the skin being contracted or conveyed in dentists' offices.

In the first place, a number of dentists have consulted the writer on account of contagious diseases of the skin. In the second place, a number of laymen, who attributed their contagious skin diseases to visits to the dentist, have also consulted him.

These facts being allowed, it is not only possible, but actually true—and, furthermore, probably of not infrequent occurrence—that the close personal relations of dentist and patient may result in danger to one or the other, unless certain precautions are taken against it.

To cite an illustrious case, when Oliver Wendell Holmes announced that physicians were undoubtedly the unwitting cause of puerperal fever in their patients, when they attended, at the same time, cases of erysipelas and obstetrics, doctors were loath to believe that this could be true, but it is now a universally accepted fact; and so it may be that dentists who, until recently, have practiced their profession in happy ignorance of danger, may upon reflection recall instances where they may possibly have been at fault.

With improvements in our knowledge of the bacteriological causes of disease, it is plain that the infectious germs found about the face in certain skin diseases may readily attach themselves to the hands, clothing or instruments of the dentist, and thus either produce disease in him, or through his medium be transferred to subsequent patients. I refer to such diseases as syphilis, impetigo contagiosa, trichophytosis, scabies, pediculosis, and alopecia.

In the practice of the writer there have been several instances of extra-genital syphilis readily traceable to wounds inflicted by dentists' instruments. A chancre of the gum, a chancre inside of the cheek, and a chancre of the angle of the lips have come under the observation of the writer, and, in his opinion, were certainly due to the above cause. On the other hand, three dentists, one very recently, have presented themselves for treatment for syphilis, acquired professionally.

It is not a rare occurrence for physicians to become infected with this disease while treating their patients, and *a priori* it would seem that dentists were more exposed to this possibility than physicians, for long after all contagious lesions of the skin have disappeared there persist in the mouth mucous patches of

the greatest virulence, and with the astounding prevalence of syphilis, especially in large cities, it is unquestionable that most dentists are called upon not infrequently to treat this class of patients.

There are four contagious conditions produced in the mouth by syphilis, and these I will briefly describe.

The first, and least common, is the chancre. It may occur anywhere, upon the tonsils or lips most frequently. This takes the form of an open sore, secreting a moderate amount of a thin pus, and is accompanied by massive swelling of the glands adjacent, the submaxillary, parotid, and post-cervical. Usually with this there is a moderate pharyngitis, and in the course of a month or two the characteristic rash appears upon the skin.

The second and by far the most frequent contagious condition is the mucous patch, an opalescent, superficial erosion of the mucous membrane of any part of the mouth. This may be present at almost any stage of the disease, and is a source of the very greatest danger. It gives rise to a scant serous discharge which is highly contagious. It is usually oval in outline, but may be irregular, and varies in size from that of a pinhead to a patch large enough to cover the whole of the inside of the cheek. Its favorite locations are the tonsils and their pillars, the under surface of the tongue, and the inside of the cheeks where they rub against rough teeth.

The third form of contagious syphilis in the mouth is the ulcerating gumma, which is usually found in the tongue. It presents a rather deep ulcer, which secretes a moderately contagious pus.

The fourth, and a very rare form is the leucopathia of the tongue which presents broad, white, sharply outlined patches, which secrete but little. It is to the mucous patch that more cases of innocent syphilis are attributable than to any other form of the disease, and it is to these that I particularly desire to call attention.

Mercury given in larger doses than are well borne first affects the gums about the teeth, causing inflammation and the

secretion of an infectious saliva. When the disease has been recognized, the dentist owes it to himself to be very careful of his hands, and to subsequent patients to thoroughly sterilize his instruments; for it seems to me unjustifiable to decline to treat a patient merely because he is in a contagious condition, since care will obviate all danger. Cuts and abrasions of the hands should be protected by collodion, or thin rubber gloves should be worn. All instruments used, whether in syphilitic mouths or in those of apparently healthy persons, should receive absolutely the same treatment.

It is perfectly disgusting to anyone to think of using another's toothpick or brush, even though it has been rinsed and wiped. No dental instrument should be used on a second person until it has been scrubbed with soap and water and sterilized.

Many objections to the sterilization of instruments by boiling were brought out in the discussion on the previous paper. It has been said that the temper of the steel was injured, that the nickel soon gave out, and the instruments quickly rusted. But, in spite of these objections, I am still convinced that boiling is the best method at your disposal. Formaldehyd sterilizers are, I understand, very expensive. Immersion in solutions strong enough to destroy germs will also injure instruments. Small copper sterilizers for boiling can be procured at very moderate expense, and are absolutely to be relied upon. If the nickel of instruments gives out, let them be re-nickeled. The mental impression produced upon the patient who sees the instruments about to be used upon him removed from boiling water is in itself, aside from other considerations, worth the trouble.

The next disease in frequency is *impetigo contagiosa*, a common affection of the skin. A barber in New Haven was recently sued by a lawyer who alleged that he contracted this disease in the barber shop, but it might be acquired just as easily in a dentist's chair, since it is through the media of hands and towels that it is usually conveyed. It is

characterized by the formation, usually upon the exposed portions of the body, of one or more little blisters, whose contents, within a few hours, become turbid and pustular. The vesicle rapidly increases in size, until it is possibly as large as a little finger nail, and then, having a very thin roof, it breaks and its contents escape. The secretion soon dries upon the surface in the form of a yellow crust, which is perfectly superficial and looks as though it were stuck on. Oftentimes there is a faint red areola round the vesicle or crust. The spot usually tingles or itches slightly, and presents a very unsightly appearance. Every one of these lesions is a possible focus of infection, for if the patient touches such a spot with his finger, and then rubs himself elsewhere, he usually spreads it. The course of the disease is indefinite, successive crops of blisters continuing to appear until stopped by thorough measures. The disease is due to the *staphylococcus aureus*, or common pus germ, and is a highly contagious affection. I have treated dentists for this disease, and consider that it may be spread as readily by them as by barbers, who usually get the credit for it. This is not the real "barber's itch," but is often mistaken for it. Veritable epidemics of it have occurred in New Haven three times within my knowledge, and one is just dying out.

Aside from the dentist's hands, the cloth which is tucked into the neck of a patient who may have the disease slightly, and then used upon some subsequent patient before being sterilized by washing, is the common medium of contagion.

The next disease to be considered is *trichophytosis*, ringworm, or genuine barber's itch. This when once thoroughly started is one of the most obstinate diseases of the skin, taking many months of painful and radical treatment to stamp it out.

The beginning lesions are as a rule easily recognized, from the fact that they generally take on a ring form, beginning with a small scaly patch, which progresses around the border and clears up

in the center. Sometimes, in delicate skins, the border is marked by a circle of minute water-blisters, instead of scales: but the liquid contents of these soon escape, and scales are left. There are seven diseases of the skin which take on this circular arrangement, but only one which is contagious affects the face, neck, or hands, and that is ringworm.

After the disease has existed for some weeks the ring shape of the lesions is not so noticeable, for the border of the circles becomes broken in places, and separate scaly patches, without any regular arrangement, may be left. In men, if the disease occurs in the bearded region, the appearance is altogether different. The vegetable parasite which is the cause of the eruption invades all epithelial structures, therefore it penetrates to the bottom of the hair follicles, and is even found in the hair itself.

When it gets into the hair follicles, it usually produces suppuration, so that the face is lumpy, and many hairs may be seen protruding from pustules. In this stage the disease will hang on indefinitely, finally, if unchecked, invading the whole bearded region and producing a boggy suppuration which is most disfiguring. This disease, like impetigo contagiosa, may easily be spread by the hands, towels, or coatsleeves of the dentist.

Scabies, or the itch, is commonly supposed to be a plebeian disease, but it has found its way into the most aristocratic circles. It is characterized by the formation of pustules which do not itch much during the day, but which claim a vast deal of attention when their owner gets warm and snug in bed. They are found most abundantly where the skin is thin, as between the fingers, on the wrist and upon the neck. The patient is usually quite industrious with his nails, and scratches the pustules into excoriations. Beneath the nails of such people the acarus finds a safe transport to fresh fields. Shaking hands with a victim, or resting the wrist against his neck may be a means of contracting the disease.

Pediculosis, or lice, may also occur in the most cleanly of people, for these

bugs are no respecters of persons. I have treated some of the most cleanly people in New Haven for an eczema of the scalp which had lasted for years, caused by nothing in the world but lice. They infest the part of the scalp where the hair is most thick, the occipital region, and this is the part that occupies your head-rests. They cause a redness, scaling, crusting and oftentimes a serous oozing of the occipital region, with enlarged glands in the back of the neck. Many a case of so-called scrofula is nothing but pediculosis. Nits, or eggs, are often found attached to the hair, looking like little flakes of dust, but firmly attached to the shaft of the hair.

While speaking of heads, I must not fail to mention the fact that dandruff, the most common cause of baldness, is contagious. There is no doubt whatever that the use of common brushes and combs, resting the head against seats in cars, or upon the head-rests of barbers' or dentists' chairs, are practices which spread baldness. Therefore the head-rests should come in for a thorough cleansing with soap and water, and a sponging with an antiseptic solution, not infrequently.

From the foregoing remarks it may be seen that the most frequent carriers of contagion in dentists' offices are—(1) instruments, (2) towels, (3) hands, (4) coatsleeves, (5) head-rests, (6) brushes and combs.

Something might now with profit be said about the dentist's hands. I have no doubt that every man present washes his hands after treating each patient. Such frequent washing, unless the greatest care is used in selecting a pure soap, will almost inevitably result in roughness of the skin, especially in winter, and in many cases, in actual eczema. I had great trouble myself from this source until I have finally hit upon a soap which I can thoroughly recommend. It is called Quinorcin soap, and is said to contain quinin and resorcin, making it antiseptic. At any rate it is very cleansing and unirritating.

There are a number of other contagious diseases of the skin which, were we

simply looking for "padding" for this paper, might be properly treated here; but my object is not to worry you with a long discourse, but rather to point out what seem to me obvious and actual dangers. I must apologize for having

repeated many of the things said in the paper before alluded to, and must express my grateful appreciation of your courtesy in inviting me to meet this distinguished body of men.

(To be continued.)

IOWA STATE DENTAL SOCIETY.

Thirty-ninth Annual Meeting.

(Continued from page 490.)

THE next paper read was "A Plea for More Rational Methods," by Dr. G. E. ROSE, Vinton, Iowa.

The item next on the program was a paper entitled "Treatment of Molar Teeth," by W. H. DWIGHT, D.D.S., Le Mars, Iowa, as follows:

TREATMENT OF MOLAR TEETH.

When I started to prepare this paper, the subject was to be "Treatment of Teeth." I saw that this was too broad, and had it changed to "Treatment of Molar Teeth." But this was yet too broad, and I have cut it until there is not much left but the use of Gates-Glidden drills.

I am well aware of the opinion most dentists have in regard to the use of these drills and of the criticism I shall no doubt receive; but I had rather be right and be criticized than be wrong and be lauded. I asked a dental salesman a few days ago what percentage of his customers used Gates-Glidden drills. At first he said about ten per cent., but on second thought concluded that there were even less than that. I find more satisfaction in their use than in any other one thing in my office, and read this paper because I feel it almost a duty.

I will say at this point that this paper

is for dentists who do not always get root-fillings to suit them, and are wise enough and honest enough to know it. But when I ask, What improvement has there been in root-treatment? you can but say, Practically none—if it has held its own. This is not because it is already so perfect that there is no room for improvement, for you all know there is no branch of dentistry which is so easily covered up and so poorly done.

Where is the glory of a perfect porcelain crown and an imperfect root-filling, or the glory of a perfect gold filling and a root with an abscess? I know where the trouble is: Root-canals are too small, too long, and too crooked! When we insert a nerve broach and give it a few turns we too often leave the barbed part in the most important part of the root-canal, or we fail to get the apex.

One of two things we must do: raise a generation of people with larger root-canals, or find a safe way to enlarge the small ones. I have done quite a little experimenting along this line, but my eldest is only seven, and Gates-Glidden drills are at hand, so I think we can do better by getting a better understanding of their use. I think the reason they are not used more is because they are not understood.

Gates-Glidden drills are made in three

different sizes, and are various shapes. The small size is made to cut on the point as well as on the sides. The larger ones have a blunt round point so that they will not go through the root, and they do their cutting on the side by enlarging. They are smallest near the shank, so if broken the piece is long and extends far enough out of the root to be grasped and removed.

The first step is to cut the tooth back far enough so that a drill may pass down the canal and not be cramped against the walls of the cavity. If the canal is narrow or flat at its opening, and nearer round as it approaches the apex, the case is more difficult. Although it is too narrow to admit a barbed broach, yet the nerve must be extracted and the root-canal filled. If such a canal were half as long and twice as large it would be very easy, but if it were twice as long and half as large it would be much more difficult. If we can enlarge a canal half way we will shorten it half and remove half the difficulty.

I always use Gates-Glidden drills in the right angle, as it is impossible to get into the roots of the posterior teeth with a straight handpiece. Start with the smallest size drill, run at a slow rate of speed. Hold the right angle loosely in your hand, with the drill inclined in the direction it will go. Do not pass the first drill down farther than one-sixteenth of an inch. Use the next size and enlarge the canal the same distance. Then use the largest size in the same way. Now use the smallest size again, pass it on down the canal about another one-sixteenth of an inch, and follow as before with the next two sizes. Proceed in this manner until you have reached the apex or the drill fails to find any more canal without being forced, which must never be done. Take a smooth broach and see if you can pass it any farther down, or, if you suspect that there is any nerve still remaining, use a barbed broach, which may now be done with safety.

It is quite evident why the different sizes of drills should be used as described. If the smallest drill were used to drill the whole distance it would bind, meet

with much resistance, and break the small shaft; but when you drill a short distance and then follow with a larger drill, the canal is straightened of the small crooks, and the small drill when again used has no friction to encounter, and having plenty of room it can follow another bend; the shaft is small, soft, and pliable, and if carefully used will follow a very crooked canal. It is no more necessary to drill through the apex than it is to drill through the side of a tooth in preparing a cavity.

If you are the least bit uncertain as to where you are drilling, stop and use broaches; the Gates-Glidden drill does not stop up a canal, and broaches may be used at any time. If you have drilled one-third or one-half way, you have gained just that much, and your chances are just that much better for a perfect root-filling.

Some roots have large canals and large openings at the apex; this, of course, is the kind of canal which does not need any drilling. Some roots are stopped at the mouth with a nodular-like deposit, but a small drill will usually find its way, and an opening having been effected the canal will be found of normal size to the apex.

Another advantage possessed by canals which have been opened by Gates-Glidden drills is the ease with which they may be filled. There is more or less contraction with chloro-percha, and the less of it left in the root the better. If the canal be large and round, a large gutta-percha point may be used which fills the canal and displaces most of the chloro-percha. If the canal be very small you have to depend more upon chloro-percha, as you cannot force it out with a point to nearly the same extent. This means more contraction and a poor root-canal filling.

This paper recognizes but one material for root-canal fillings, and that is gutta-percha cut in chloroform and held with eucalyptus. I have no sympathy with any material which offers as an advantage the claim that you do not need to remove all the nerve. The only way I know to prepare eucalyptus and gutta-

percha is to first dissolve the gutta-percha in chloroform, then add the oil of eucalyptus and stir until it unites. This is too thin for use, but if the stopper be left out the chloroform will evaporate, leaving the gutta-percha held by eucalyptus. This is always ready for use. In time it will get too stiff to be picked up on a broach, but this is the most desirable condition, as a little heat will make it soft enough to use. I have removed root-fillings which had been in for several years, and so far as I could detect they were just as strong of the eucalyptus as the day they were inserted.

I do not care to bring up the subject of immediate root-filling for discussion, but the method here advocated would seem to me specially useful for dentists who *do* practice immediate root-filling.

I will pass you two bottles of gutta-percha and eucalyptus. This one, marked two years old, was all used but this small portion, but you can readily detect the strong odor of eucalyptus. The other bottle has been made for probably six months or more.

I do not wish to be understood to advocate this combination in preference to chloro-percha. If a root has been thoroughly saturated with an essential oil until it seems to be perfectly sterile, and has no odor except that of the oil, chloro-percha is as good. But in cases where you do not have a chance to do this, it would be better to use the gutta-percha and eucalyptus.

I hear some one say, Yes, I have used Gates-Glidden drills and have broken them off in the canals, and I have quit using them. That is no doubt true. You have broken off barbed and smooth broaches too—and maybe they were projecting through the apex. How long did it take you to learn to prepare cavities, and how many years did it take you before you were able to put in a perfect gold filling? Would you have mastered it if you had quit at your first few failures? If you had never done any porcelain work and were to buy a furnace to-day, what would you do? You would go home and practice with it; you would bake and rebake

before you would attempt a practical case; and rightly so. Did it ever occur to you to do the same with Gates-Glidden drills? If not, let me make a suggestion: Do not criticize them if you know nothing of them, but buy a dozen and practice with them on the first molar tooth you extract. Use them again and again, just as conscientiously as you would the furnace, and you will find that they are great time-savers and one of the greatest blessings we have.

When you get thoroughly familiar with their use you will do better work. You will not find that perfect porcelain crown groaning under an imperfect root-filling, nor that tooth with a perfect gold filling having an abscess. But you will have brought root-treatment to a par with the other advancements in dentistry, and have made the roots worthy of any degree of future advancement. You will be helping yourself, your patient, and your profession.

Discussion.

Dr. E. W. BROWER. I am glad to hear a paper before the society on the preparation of roots and filling. I have written on the same subject myself, and I have met opposition, strong and strenuous. I am a thorough believer in using Gates-Glidden drills in opening up roots; they have been in constant use in my office for more than twenty years, and I would sooner dispense with anything in my operating case than the Gates-Glidden drill. The only thing necessary is to be sure, and as with everything else, you will not be confident until you know how to use it, until you can handle it as well as the forceps. One great trouble in root-filling that I find, especially with young men, is in opening up the canals where there is an abscess. Go into it and look at it; you will find nearly always a constriction of the opening of the root-canal; the root changes. The root-canal is larger below. Why is it that so many practitioners fail to recognize that one little thing that he is looking at every day? In using the Gates-Glidden drill I do not mean to say that we must go to the end of the root; but

the main thing is, to open up that constriction, make a larger opening at the beginning of the root-canal, and from there down. I do not mean to say here that I have never broken a Gates-Glidden drill, but I will say this: that I have dulled more than I have broken and thrown them away as I would a dull bur. I never was a believer in metallic points of any kind.

Of course we all fill some roots with broaches—that is, all my friends! I have heard of some people that only had one, and some none, and probably some have forgotten about it, or did not notice that the point was getting shorter, and probably only had one and wanted to use it a long time, and as the point got shorter probably it looked longer; but I expect that the most of us who fill roots have had some experience occasionally.

Dr. MONFORT. I was very much interested in the paper, especially as the essayist spoke of the use of eucalyptus; I have been using that for some time. I do not use it just as he does. I use eucalyptus oil. I have not used it in chloro-percha; but if you first moisten the canal with it, you will find the chloro-percha will follow the canal and give you better results.

Dr. H. L. MADISON, Burlington. I suppose there has been as much written on this subject as on any subject in the dental profession, and I presume there are as many ways of filling root-canals as there are dentists here. The doctor who has just spoken uses Gates-Glidden drills; after he has been in practice a number of years he will probably change and use something else. I presume all of you have used them and thought they were a good thing. They are, but there was one mentioned last evening in the discussion which I think is better than Gates-Glidden drill, viz, Kerr's, also Downie's. I have used the Gates-Glidden, and then changed for Kerr's; now I am using Downie's. Perhaps they are not quite so rapid, but I think them a little more sure—not quite so apt to break. Now, I do not want to advocate any new method of filling root-canals,

but I am going to give my experience for what it is worth.

I have used the gutta-percha or chloro-percha with gutta-percha points, with what I considered considerable satisfaction; but several months ago I noticed an article in one of the dental journals advocating Dr. Söderberg's mummifying paste, using it in root-canals, not only those from which the healthy nerve has been extracted, but those which have become diseased or are abscessed. There is nothing in the mummifying paste that would be harmful in a case of that kind. Several months ago a case came to my notice which had a fistulous opening that had existed for several years. I treated it until there was no reaction by using hydrogen dioxide, and then used eucalyptus, wiped out the canal thoroughly, pumped the canal full of Dr. Söderberg's mummifying paste and then put in my gutta-percha points, and made a permanent filling. The result was very fine indeed, and I have used it in several cases since that time with good results. If any other dentist here has used that method and does not advocate its use, I should like to know where I am in error and what the experience of others has been.

E. T. BRUNSON. This is the first time I ever heard in dental societies of that treatment. I have tried it myself, using it in the form of a thin paste and then inserting a gutta-percha point. I have always been afraid of some criticisms until I felt more thoroughly assured that it was a success. I have kept trace of a number of those cases. They have been filled nearly three years, a majority of them, and I have had no bad result from them; I think if there had been any trouble from them the patients would have come back, because I have always told them to come back. I am glad to hear that some other gentlemen have tried this and have had good success, such as, I am pleased to be able to say, has been the case with me.

Dr. C. E. WOODBURY. I very much dislike to hear any man make the remark that he only uses one method of filling roots. There are several different meth-

ods, each one good in its place. Chloro-percha and gutta-percha is good in some cases, and other things are good for other cases; and I think we should choose our cases and fill them according to the condition of the root, and not use one method only and try to make that method fit every case. Another thing: There are few cases in which I apply arsenic; when I do, I have a way which I have not tested long enough to warrant my bringing it before the society, yet, as the subject is up, I will speak about it. I put in a small quantity of arsenic, leave it in from three days to a week, and then take it out, drill the pulp-chamber out, and fill it up with mummifying paste, seal it up, and let it stay in for a month. When the patient returns at the end of the month, I ream out the root-canals and fill as well as I can. In this way I obtain the advantages of both the root-filling and the mummifying method. If there are any small particles of pulp that I have been unable to get out they are mummified, and I have the security of the filled roots as well. Another thing is that when you open up the canals at the end of the month there is no sensation, and you have the comfort of operating on a patient whom you are not hurting, and from whom you will receive grateful thanks.

Dr. ASHLAND. I believe that if we pay more attention to how we are going to penetrate the root-canal we will be a great deal better off. One point Dr. Dwight brought out in regard to the Gates-Glidden drill: the fact that in using the drill you must not go in beyond one-sixteenth of an inch at a time without ascertaining the direction of the canal.

Dr. T. A. GORMLY. The matter of root-filling can be very easily solved, providing you get the proper opening up of the root-canal. I think my preference in starting in, at least after the pulp-chamber is opened and the extent shown, would be the use of a Kerr broach. It is a little safer than a Gates-Glidden drill; you have smaller sizes which can be used quite effectively in

leading the way to the root-canal. They are a good deal like a twist drill and have sharp cutting edges but no barbs. Turning to the right the broach will draw into the canal like a screw and ream it out very nicely, and turning to the left will withdraw the broach. Their name, the "Universal," shows their adaptability.

The PRESIDENT. I think it is the sense of the assembly to have some remarks from Dr. Brown in regard to

GUTTA-PERCHA IN RELATION TO CROWNS.

Dr. BROWN. What has been said is true not only of gutta-percha, but also of cement or any other cementing substance. It has been stated that some of the crowns set with gutta-percha are not satisfactory. That is true of any material. I have used gutta-percha—perhaps not exclusively, but almost so—for certainly over ten years, and during the last few years, as some of you know, I have not had anything very much to do with crown or bridge work, except that which is inserted for the purpose of correcting occlusion or for the support of very loose teeth. I think it safe to say that the bridges I have to set are about as trying, most of them, as is possible with anything of that kind, because I frequently have to put crowns and bridges on teeth which are so loose that it is with the greatest difficulty they can be manipulated at all without having the roots come out in my fingers; yet I know that if I can get pins set and the jaws properly adjusted to occlusion which will be correct, I can make those teeth useful for many years.

The reason why I like gutta-percha is this: I do not believe there has been a cement made that is anything like perfect; no cement ever was made that I know anything about that is reliable in the presence of the buccal secretions and the different conditions that cement has to meet in the mouth. Sometimes cement will do in the mouth of one patient for many years comfortably and nicely, and the very next trial with it, perhaps from the very same package, in the same mouth will be a failure. In view of this

fact, then, and in view of the additional reason that the tissues surrounding the teeth are transitory structures—for there is no question at all in my mind that the pericementum and the alveolus and those structures which surround the teeth change, as individuals grow older, until in great part they gradually disappear—and that the gingival border is also changing as to form, and the position of the tooth changes just as the other teeth in the jaw change, we must understand that however perfectly we insert a crown or however perfect a crown may be at the time of insertion, the condition in after years may be altogether changed; the bond of union between the cap and the crown of the root changes completely at the gingival border, and in a number of years will often be badly exposed, so that if we have a material that is more reliable than cement in the face of these secretions it is worth making every effort to use it. That is my argument in favor of gutta-percha, as it certainly does withstand the secretions better than does cement.

Now, so far as the method of using it is concerned, I hope to demonstrate it if a suitable case presents itself—and the instrument that has been shown by Dr. Peterson seems to be a most excellent one for the purpose. I do not believe in trying to use gutta-percha in a haphazard sort of way and depending entirely on that pressure or anything else for adjustment. I think if you are going to use gutta-percha successfully it is necessary to have a little surplus, so that your gutta-percha may be under pressure when set. It is important in using anything which expands as gutta-percha does that it should be set under more or less pressure. Of course, if the pressure be too great and you have too much material, your crown will not be in place. If the crown fits perfectly the gutta-percha will hold it with absolute security. If your crown does not fit, gutta-percha will not do to make up for something that was lacking when you made the crown. The gutta-percha is sufficiently hard when it is set and is quite dense enough to hold the crown, while it holds

at all, quite firmly, but, if not, then the structure, crown or bridge, loosens altogether—and that brings us to the fact that the greatest danger in using cement is that a portion of the cement will disintegrate and a portion hold firmly, and while it hangs on, apparently secure, there will often be great damage done. There are fermentive changes taking place which allow of the destruction of the tooth-structure. Moreover, I think that such conditions are irritating to the gingival border where it disintegrates around the band by the gathering there of substances which are irritating, to say the least. Therefore, when treating any irritation of the gum, as pyorrhea alveolaris, you must avoid everything of that kind.

If this [illustrating] were the cap of a crown that I was going to set with gutta-percha, I would cut the gutta-percha into small pieces and heat them over a heater, or put the crown and the gutta-percha on top of one and warm it until the gutta-percha began to puff up—not too much, but just so as to swell enough to allow it to soften sufficiently to become plastic, then put it lightly over the crown. Lay these little pieces one at a time around the border, then take a burnisher and burnish them down to the little cap, as near as you can, taking care not to have too much of a surplus of gutta-percha and to allow a little border of gutta-percha to lap over. So far as the pin is concerned, I make a little roll of gutta-percha and press the pin into it, allowing it to be slightly longer than the pin. I take the crown and put it back on the heater and heat it just as hot as I can bear to take it in my fingers. Now, do not deceive yourselves, if some of you should attempt, or be tempted to handle it with something else than your fingers, because you might have something happen to you that happened to one dentist whom I knew and whose patient had necrosis. Too much heat not only destroys gutta-percha but also destroys tissue. When you can take crowns in your fingers they are safe and I always handle them with my fingers. I take the crown or bridge, as it may be,

and I push it right up into place. If it goes up to where I want it I leave it, and if it does not I take it right off again before it has time to set. That is the beauty of gutta-percha.

One thing you do not want to forget: If you get too much cement and it sets with your crown not in place, you have to let it go or practically destroy it in order to get it off. If you have it partly on with gutta-percha and it does not quite fit, pull it right off while it is still soft; then you have a perfect impression of the inside of the root and the border of it, and with a very little surplus taken away it can be reheated and put on the same way. In that way it is possible to set any bridge or crown that you may desire to set absolutely perfectly. The term "absolutely perfect" is used in a reasonable sense, meaning that there is certainly no better method of approaching perfection. I say this rather boldly now, more boldly than I did at the Columbian Congress, where I had a paper on the subject, for I was not so sure of it then. But now I have not any doubt at all about it, and I am very glad to have the opportunity to say so.

Discussion.

Dr. MONFORT. I would like to ask Dr. Brown what proportion of gutta-percha he uses.

Dr. BROWN. I use just plain, ordinary base-plate gutta-percha. I believe in it, I like it, and think it is all right. Of course, the high and the low-fusing and the medium gutta-perchas are all right, and there are times when, perhaps, the low-fusing is of more assistance. The high-fusing I do not think we would have any use for, because contrary to what we should expect, it is not better, but is less useful than those which soften at a lower temperature. In other words, preparations that are added to the gutta-percha to make it fuse at a high point do not add to the value of the material, but simply make it more brittle. The low-fusing is all right, but the medium-fusing is better.

I forgot one thing I wanted to say, which is important. You have to depend

upon a lubricant in using gutta-percha, especially when you put it over the surfaces of the teeth, in capping crowns, and work of that kind. I use eucalyptus and I apply it freely. After having dried the surface of the tooth to be crowned, get the root dry, put eucalyptus on cotton, and flood it all over. Then, when I am using gutta-percha to put on the bridge work, or a series of bands, where I have a considerable number together, I use a thick solution of chloro-percha at the gingival borders, but not around the crown, I want it so that it will press in there to make up any little deficiencies. No matter how carefully you handle it, it may draw away contrary to your wishes, but if you have that, it simply dissolves the gutta-percha a little and this takes up the surplus solution that is there, and you have the best cement you can possibly have around the gingival border.

Some one spoke of the irritation of gutta-percha. I want to say you need not have any fear of gutta-percha as an irritant. A few years ago when I was doing dog surgery, I found trouble in making the bandages stay on, as the dogs tore them off and the stitches were all destroyed; but we conceived the idea of coating the wounds with gutta-percha in a thick solution of chloro-percha, and putting on one coating after another until we made a thick dressing of it, and those wounds would invariably heal quickly under that chloro-percha. The granulations would form perfectly, and I have depended upon it frequently in mouth operations in many conditions where I wanted granulation to take place. I use it often for the treatment of pyorrhea by saturating cotton with it and packing the pockets with the dressing thus prepared.

Dr. G. V. I. BROWN, Milwaukee, Wis., then read a paper on "The Application of Orthodontia Principles to the Prevention of Nasal Disease," which, with illustrations, will be published in a future issue of the DENTAL COSMOS.

The subject was passed, and Dr. W. T.

REEVES, Chicago, Ill., read a paper of which the following is an abstract:

PORCELAIN INLAYS AND RESTORATIONS.

All who start to do porcelain work should begin by doing careful experimental work on dummies in the laboratory, carefully tabulating what they observe in a baking, and comparing such records with what they see in subsequent bakings, and thus learn by observation when porcelain is properly "biscuited" and properly glazed, and to *know* this, for porcelain over-fused loses all its good qualities and results in failures.

The pioneers in modern porcelain work knew only too well the difficulties with which they had to contend in the materials they had at their command, and, in deference to their increasing demands, the manufacturers went to work and through a series of experiments endeavored to produce a grade of porcelain which would give the best practical results: strength, density, translucency, and fixity of color being the qualities desired. Thus the material of to-day was brought forth, and I think there is hardly anything more to be desired as far as material to work with is concerned.

What are the qualities to be desired in a material to replace lost tooth-substance? I will name, as of first importance, durability; second, compatibility; third, availability; fourth, practicability; and last, esthetic quality. Under these headings I think can be catalogued all the qualities desirable in the ideal material to replace lost tooth-structure; and I know of no material that will come so near filling all requirements as will porcelain used as inlays.

Durability will come very near covering all the ground, for any cause that detracts from durability is chargeable against the material used. Permanence of the operation to be performed is always desired, and heretofore gold has been the sheet-anchor of the American dentist for giving permanence to his operations. All know how short-lived the average gold filling of to-day is; it is placed at from three to five years. Why this lamentable condition? Imper-

fect conception of cavity formation, imperfect condensation of gold, and imperfect finishing of the filling—any one of these three will result in failure.

It is this condition that has brought out so much in writings and discussions in the past few years on "extension for prevention," and "contour." We all know how few operators there are who are putting in ideal gold fillings, as to cavity formation, contour, condensation, and finish, and in making comparison I will only cite these operations and will exclude the medium and poor gold fillings.

Lest some may think that only the simpler cavities are intended for comparison, I will state here that I restore with porcelain the most extensive cavities in bicuspid and molars. How often there is failure of a perfect piece of work because the tooth would not stand the stress of mastication and the filling broke out, although there was no decay to cause such breaking. A porcelain inlay in such a tooth would have strengthened instead of weakening it.

Again, how often, following the most perfect operation, is there recurrence of decay; here again a porcelain restoration will do its best service. It is an unaccountable fact, but the clinical experience of all inlay workers of any considerable period is that there is seldom or never any recurrence of decay around inlays. In a period extending over about ten years I have yet to have the first case of recurrence of decay around an inlay.

Compatibility. We all know how many cases come to us in which we would not dare to put a metallic filling, as we know that the pulp would be almost sure to die under it; we do one of two things, temporize or devitalize; if we temporize it is pulp-capping, cement filling, or what not; at best we are only putting off the evil day. If we devitalize, what an amount of good, sound dentin we often have to cut away in order to gain access to root-canals, and what a consequent weakening of the tooth!

In those that are desperate cases one can make and set a porcelain inlay with the consciousness of having restored the

tooth to its full usefulness with no fear of the death of the pulp or that it will become necessary to open into and devitalize on account of pulp-irritation, for it has become a well-established fact, through clinical observation, that porcelain is the best non-conductor of thermal changes of any material we have ever used.

Teeth with sensitive cavities at the gum margin, or extensive cavities that, filled either with cement or gold, were an annoyance to the patient—not enough to endanger the pulp but just enough so that the patient was always conscious of that tooth and wanted something done—have on removal of these fillings and their replacement with porcelain inlays become perfectly normal in condition, the patient losing all unpleasant consciousness of having that tooth in his head.

Availability. What filling material have we for any given case? What are you going to do with those high-strung, nervous temperaments to whom it is a physical impossibility to sit in the chair and have a cavity prepared for a gold filling, or even a cement filling? In these cases porcelain inlays are a boon to both patient and operator, for with them good, permanent work can be done. There is no material we use, for the reception of which the cavity can be prepared with as little discomfort to the patient as for the insertion of a porcelain inlay. There is no necessity of extension for prevention, and no undercuts need be made.

Again, there are those patients for whom you have prepared a cavity after a fashion, and have put in a gold filling, knowing all the time that you have not done justice to yourself and that sooner or later the operation will fail, and that the second condition will be worse than the first. You excuse yourself on the ground that you did the best that you could under the circumstances. Probably you did as well as any one could have done under the same conditions; but with porcelain you could have put in a perfect filling, with satisfaction to yourself and to the patient. The fore-

going class of patients will appreciate the comfort of the operation more than any others.

Again, in the teeth of children from eight and ten years and on through the years of development up to sixteen and eighteen years of age, in whose teeth it would be almost criminal to put gold fillings, and where cement wears away so fast as to be dangerous, permanent work can be done with porcelain inlays.

Again, those teeth so badly broken down that there is not tooth-substance enough to enable one to cut retention that will hold a metallic filling, and which are condemned to be crowned as a last resort, can be saved for a good many years of useful service with an inlay, thus putting off the evil day.

Practicability. Is it practical to make porcelain inlays? I think that all operations that result to the good of the patient, and can be performed with the minimum amount of taxation upon both patient and operator, are practical, and any operation that is practical will receive remuneration just in proportion as it is practical.

Esthetic quality. Here porcelain inlays are so far above and beyond all other materials as to have no competitor. The majority of dentists will place the esthetic feature first in naming the points of porcelain as a filling material, but I place it last, for I consider it is the dentist's first duty to serve his patient in all that he does in a way that is for the best good of the patient, and to do it in a way that will be the least objectionable. We are all so used to seeing an extensive display of gold in the front teeth that I do not think we appreciate its ugliness, nor can we appreciate the ever-conscious annoyance to the refined, sensitive nature of one who has the misfortune to have an extensive display of gold in the front teeth.

Some travel the high-fusing way and some the low-fusing. I am first, last, and all the time in favor of high-fusing bodies, *i.e.* bodies that fuse above the temperature of 1840° F., or the melting-point of gold. The division seems to be a geographical one also, for the great ma-

jority of the Eastern inlay workers are followers of the Jenkins methods and users of the Jenkins bodies, while in the West they are almost exclusively workers of high-fusing bodies. The one great point the Jenkins followers make, and about the only one they have a shadow of a claim to, is the greater ease with which gold can be burnished into a cavity to form a matrix; but the greater ease and safety with which a platinum matrix can be handled afterward more than counterbalances this advantage, both in time saved and in the accuracy of results obtained over gold. I know of no cavity in which gold could be burnished in which platinum could not be burnished better, and I can call to mind several in which if gold had been used it would have been so distorted in removal from the cavity as to be useless as a matrix.

The technique of burnishing platinum into a cavity to form a matrix is simple, and it is possible for everyone to attain such proficiency in this part of the work as to insure an absolute fit of the inlay. I divide the burnishing into four stages, every one of which must be completed before proceeding to the next; and the end will be a perfect matrix. I will not take the time here to describe my method, for I expect to give you a practical demonstration to-morrow. In passing I will say that I consider the time taken to get an impression and run up a model is so much time wasted, for, as a rule, much better results can be obtained by burnishing directly into the cavity. I will burnish a matrix from start to finish in from fifteen to twenty minutes, and it would take anyone about that time to get their material ready, lute the cavity, and take an impression that would be worth anything, and then they have to run up the model and burnish the matrix, which precludes the possibility of finishing an inlay at that sitting.

The qualities one must have to be a successful inlay worker are twofold, mechanical and artistic, with delicacy of manipulation in both. The first we have touched upon in matrix formation; the second comes in the handling of bodies

so as to produce a perfect match of inlay to tooth.

Theories become principles when time proves their truth, or when clinical practice demonstrates their soundness. It has been the almost universal practice of inlay workers to select a body by their shade guide that seems to be a perfect match to the tooth, or to change it by adding a little of this and that body and baking the inlay all of the one body or mixture. When I first began to make inlays it was a theory of mine that different bodies should be handled in a different manner. I am now preaching that theory as a principle and I have an ever-increasing following, and in time I believe it will be generally accepted as a true principle in all porcelain work.

It has always been a theory of mine that, to obtain a true color and the translucency that is so desirable, inlays must be built up in layers, modifying the color by allowing it to reflect through an overlying color, each layer being baked by itself. I have some samples and inlays that I shall show at my clinic which I think will prove beyond question the correctness of this theory. In this way you can vary the shade of an inlay so that you can match all the shades of the tooth from the neck to the cutting edge; also you can obtain those steel-blue tinges and the discolored effects that have been so impossible heretofore. Now, you can only obtain these effects with the high-fusing bodies; low-fusing bodies lack translucency and it is impossible to handle them in this way.

I believe more true artistic ability will be cultivated by noting what degree of color is obtained by the thickness of the layer of body put on, and the extent to which it is modified by the overlying bodies, than by any other method, for you can reproduce to-morrow what you did to-day; and you could never mix bodies together in small quantities twice alike.

This brings us to the method of selecting the colors your inlay is to be, and here I want to bring before you a new principle in color selecting. It is the general practice to select the color as you

would the facing for a crown; a person might select a facing that, placed between two natural teeth, could not be detected, but if a corner of that facing were joined to the corner of either adjoining tooth, it would not match at all. Why? Because each tooth has different underlying colors. The facing was perfect for general effect, but the corner of either adjoining tooth has different underlying colors. It is the underlying colors you want to look for. It will surprise you when you look at a tooth in this way what a different lot of colors you will see; and it is just in proportion as you are able to see these underlying colors and are then able to reproduce them in your inlay, that you will be successful. It will surprise you when you look at what you would say was a typical light yellow tooth to see that there is either a gray or blue tinge inside of that tooth. You want those colors in your inlay or it will not be a perfect match. Now, I use the shade guide, not to get a match for the tooth, but to help me in looking for the underlying colors and the degree of those colors.

I want to call your attention to the possibilities there are in the use of what I call primary colors; they are as deep as the colors on this card; they are high-fusing bodies and not paints, but they must be used as paints would be, by putting them on mixed with oil, for you cannot put them on thin or smooth enough mixed with water, as you do ordinary bodies. These are a set of colors made for me by Mr. Brewster of Chicago, and are meeting a long-felt want. Their use is not confined to inlays, but they can be used to artistically change facings and teeth for all kinds of artificial dentures.

One more theory I want to offer you. There are those to-day who are baking into inlays for extensive restorations of corners, etc., platinum pins and loops for the purpose of retention. I have passed through all these different stages in the evolution of inlays. It was in 1896 or 1897 that I discarded everything of that nature in extensive restorations, and about three years ago that I left off undercutting cavity or inlay. I believe

inlays are retained by close adaptation and the cement setting under pressure, on exactly the same principle as that by which a joiner joins two pieces of wood; he prepares the surfaces to be joined so that they are in perfect adaptation to each other, and placing glue on those surfaces puts them in a vice or clamps them together under as much pressure as he can, until practically all the glue is squeezed out, and leaves it to harden; and the less glue there is the stronger the joint. That I believe is the true principle upon which inlays depend for their strength of retention.

When an inlay breaks out of a cavity you will observe that the cement remains behind and the inlay comes away clean, showing that the glazed surface of the inlay is not conducive to retention. It was formerly my practice to score the reverse side of the inlay with a knife-edge carborundum wheel, removing as much of the glaze as possible, but often inlays were of such size and shape as to make this extremely difficult; it has become my practice for some time to etch the reverse side of all inlays with hydrofluoric acid; this removes all the glaze, leaving a roughened surface, but does not alter the close adaptation the inlay must have for the interior of the cavity as well as at the margins.

We are now up to the fee, and I will leave that for each of you to adjust as his conscience dictates.

Discussion.

DR. BROWN. I will start the ball rolling by saying that I would like to express my appreciation of the good points the doctor has brought out to-night; and I would like to tell you how it pleases me to see this work develop. It is now a little over twenty years since I began to be interested in it. For a number of years I did a great deal of that kind of work; not *this* kind of work, doctor, but *that* kind of work, and I have always felt that the argument which has been made here to-night in favor of inlays was very largely true. Ultimately I expect to see great things come from such careful development as the essayist has described.

But I was going to ask the doctor's pardon and protest against one thing. I object to the statement in regard to inlays as being "permanent," except inlays that are lined all around the border with gold; that only is a perfect inlay. So long as it is necessary to join these inlays to the tooth-substance by cement, no matter how perfectly you may do it, until you have a perfect cement (something which we have not), you have in a greater or less degree an imperfect operation. I believe the trouble in this question is not with the cement-maker—at least until someone may find, perhaps, a varnish that will be permanent. The doctor was pretty near it when he spoke of varnish. I think it will be necessary to have a varnish of some kind before we get so that we make these inlays perfect, and when we reach that, it will be the extreme point to which we are able to carry fillings of this kind. What I say is not in a derogatory sense at all, because I think in the hands of careful people we will see more of it in future years. I could not say that in ten years I have not had a failure; but among the fillings made in that time there are a considerable number doing good service, and which perhaps will continue to do good service; but, as a filling proposition—something you undertake to do and depend on in the same way as you depend on a gold filling—it has not, in my opinion, reached the point. It will do so ultimately, it is to be hoped.

Dr. BAKER. The paper that the doctor has given us to-night is, I think, one of the most finished papers that I have ever met with in all my reading on porcelain inlay work. Points have been brought out that I have never seen published; I do not know whether others have or not, but everything that I could find to read on the subject I have read. For the finished paper and the beauty of the work that he has brought out, I believe the doctor deserves the thanks of the society.

He says, in the first place, that we must not think when we have obtained a few bottles of porcelain body and a furnace that we are fit to go to work and

put in porcelain inlays. No, gentlemen! that is the smallest part of the preparation for placing porcelain inlays, and when you take this up—as no doubt most of you have—you are merely beginning a series of experiments which only after many years of experience can teach you to do inlays. He says you must begin in the laboratory on dummies, on the teeth that have been extracted. There is the main point, and too many of us when we took up the work ten years ago began in the wrong way. We began in the mouth, and the work—as done at that time—placing inlays and grinding their surfaces, using porcelain that when ground could not be polished, and neglecting after grinding to put this work through the furnace and glaze again—could do nothing else but go to ruin. But, as he gives it to us, at the present day porcelains have been decidedly changed and brought out by experiment and test, resulting in porcelain that I will not say is perfect, because I believe that porcelains have just begun to be developed. The porcelain of to-day will probably not be used at all within a very few years, because there will be that which is easier and better working material; that is, porcelains that we can work with more accuracy than we can the porcelains we have to-day.

At the beginning of his paper the doctor spoke of the lasting properties of these inlays, and first of gold inlays. I experimented with gold inlays, and while I will not say that the first inlays I put in were gold, yet some of the finest work that I have done are those gold inlays that I put in soon after I started such work, and they are looking and lasting as well to-day as any gold fillings that I have ever put in.

As for the lasting quality of the cement. Now, cements are imperfect, but from the experience that we have with cement in connection with inlay work we know that the result is not the same as when used in filling cavities. As a material for the retention of inlays, cement is lasting better—as previously remarked by Dr. Reeves—than as a filling material.

The use of porcelains as he presents them, with the handling of coloring matter, is something that the doctor has developed in a way that I have never heard before, and that I believe will be of greater use in giving us the color and the shade and reflection of color than anything we have had. We could never tell, in the use of porcelain heretofore, what the color would be that we were seeking for, because in one way you looked at an inlay it might look to be a perfect color, and in another position you may have a shadow upon it that would not be correct; but with underlying colors we may have something that will give us the shades of the inlay correctly in all positions.

The preparation of the cavity, which the doctor passed over rather quickly, will, I suppose, be brought out better in to-morrow's clinic. The preparation of the cavity for inlay work, I believe, is the foundation of all the lasting properties of the inlay. Preparation is to be made not only for retention, but so that a matrix may be placed in there that can be removed without being sprung in any way. Dr. Reeves says we do not have to look for the "extension for prevention." That is going pretty far. I am still inclined to believe that we will need a little extension for prevention in these cases, because if it does not begin just at the edge of the porcelain inlay the decay may begin in some defect a little bit farther away. I believe that I must cling to some extent to that extension, and thus we find that there is a little more than the doctor gives it credit for in the preparation of the cavities. He may show us some of these things to-morrow that will make them plainer to us, but it is not exactly plain to me that we must have no undercut or retaining shape to our cavity, and have only the retaining quality of the cement itself.

As to the satisfaction with this work, we can have nothing but appreciation. Dentistry has been brought up on the foundation of gold fillings, and it has been shown that we can do wonderful things with that; but the appearance of

gold fillings has always been a reproach to the dental profession; and I do not think that there is a dentist in the room but would hail with the greatest delight anything that would give us the opportunity of doing away with the disfigurement of the face by these large gold contour fillings. But we have been obliged to use them, as we have nothing else to take their place. Cement is a worse disfigurement, and of course amalgam is not to be considered at all, where it shows; but when we come to porcelain work, if it can be made so that we can all use it—so that we can all work with it with any certainty or accuracy—it is the long-searched-for thing in dentistry! It appears to be, so far as we have been able to work it, a success—a filling that is satisfactory to us. It will last, as far as experience goes at the present time, as long as anything we have used heretofore.

Dr. W. H. K. MOYER, Little Falls, Minn., then read a paper on "A Comparison of Hand and Engine Instrumentation." (Published in the Cosmos for April, page 286.)

Discussion.

Dr. F. J. RUGGLES. I was very much pleased with the paper. I am thoroughly converted to the idea of the use of the hand instruments for the preparation of the cavities. I used to be guilty of the use of the engine bur for the preparation of cavities myself, exclusively; and I doubt not that I have used some of those burs that were minus a cutting plane, a sharp edge, and from some of the odor detected I should judge that some tooth-substance had been melted down as suggested by Dr. Wedelstaedt; but since using this other method I find my work is much more satisfactory, and through the kindness and courtesy of Dr. Wedelstaedt in showing me some of these points I have been able to enlist the good feeling and appreciation of my patients in behalf of this work.

Dr. E. K. WEDELSTAEDT, St. Paul, Minn. I have listened with much care

to the reading of this very excellent essay, and it affords me much pleasure to indorse all that the essayist has said; further, I wish to compliment him on calling our attention to all the good things he has enumerated for our consideration. I do not know where to begin to discuss this very interesting subject. I have just left my practice, and perhaps some little good can be accomplished if I speak of some of the operations. But before I do this let me say to you that I am of the opinion that altogether too little use is made of hand instruments. Too many men are unfamiliar with the use and application of sharp chisels, excavators, trimmers, etc. There is a tendency on the part of the great majority to use the engine bur, disk, etc., for doing the greater part of all operations. I feel that better results are at all times obtained where there is a combination of the two. Hand instruments have their place and use, and the engine has its place and use. Perhaps much good could be accomplished if we studied more carefully the use of both and applied each in its respective place. That, however, is a matter which is gradually taking care of itself, so nothing more need be said about it at this time.

Last week a little miss, eight years old, came per appointment to have one of her teeth filled. Her mother made the appointment the week before, and I had never seen the child until she was brought by her mother, who had some shopping to do and left the child, saying that she would return later on for her. On looking over the child's teeth I found that a number of her temporary teeth had been filled with amalgam, some with cement, and others with gutta-percha. There was a large cavity of decay in the occlusal surface of the lower left first molar, and the youngster complained that she could not eat on that side of her mouth. She also said that she had had the rubber dam applied a number of times. From her general appearance I thought her an extraordinarily good patient for one so young. But I very quickly learned to the contrary, for no sooner had I adjusted the rubber dam than the

child became quite hysterical. I instantly removed the rubber dam and dismissed her; in doing so I said that she had better go to some other dentist, for I could not operate for her. She sat down in the reception room and a little later came to me, threw her arms around my neck and cried as I have seen few children cry. After pacifying the little thing, another appointment was made, which she kept and the tooth was filled. After the operation she informed me that all the teeth she had had filled had been filled on three different occasions; that she was not afraid of having teeth filled, did not mind the method I used, but she did just hate the dental engine. When her mother returned for her I said, "Some butcher has been filling this little child's teeth." Her mother looked up at me very quickly and said, "Yes, I guess you are right. It was her grandfather."

Now gentlemen, this is not right. I do not believe in taking little children, eight years old, and deliberately misusing them, and to such an extent that they are in a "condition of pain," as Dr. Black says. This child's condition was brought about through the use or misuse of the dental engine. I question the right of any man to follow methods that naturally lead to placing children in this condition. Here is a child but eight years of age who will go on through life continually thinking of the barbarity of dental operations. I do not believe in misusing children. But I do believe, as Dr. Moyer says, in doing good and being kind. Operations can be very greatly expedited through the use of hand instruments, and wherever it is possible they should be used. Decayed dentin should always be removed with hand instruments and not with a bur in the dental engine. I wish to fully indorse and emphasize every word that Dr. Moyer has said about this thing of using a dull bur in a dental engine. I consider it a most barbarous method of preparing cavities, and when I say this to you I speak from a very bitter personal experience.

In my operation this morning I merely opened into the cavity from the occlusal surface with a bur in the dental

engine. Thereafter the cavity was practically prepared with sharp chisels. The patient had never had a cavity prepared before—in fact, she had never had a tooth filled in her life, and we did not hear one complaint from her from start to finish.

For the past two or three years many of you gentlemen have asked me for the secret of Dr. Searl's beautiful cavity preparations. I think practically the truth is spoken when I say that the doctor uses intelligence and sharp instruments in his operations. His instruments are used for that one operation and then they are re-stoned. It is far easier for me, I know, to expedite my operations through having sharp instruments. So much for the use of instruments in cavity preparation.

Permit me to call your attention to this illustration of five teeth. Each of

the teeth there illustrated had gold fillings in their proximal surfaces. The operations so far as the preparation of cavities, the packing of gold, etc., were made very well, but when the operator came to finish the fillings he used a rotary disk. He ran this disk from the occlusal surface to the gingival margin. He did not make a point of contact, but he made a contact surface which extended from the occlusal to the gingival. Well, the next illustration shows the conditions returned to what is known as normal. This particular part of Dr. Moyer's essay comes rightly under the head of "trimming fillings to form." It is a most important subject and I should like to interest you further in it, but I do not desire to talk all day. At any rate, I think this about covers the subject.

(To be continued.)

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PHILADELPHIA, JULY 1903.

EDITORIAL DEPARTMENT.

“THE COLLEGE MAN.”

WE publish in this issue an article by Dr. Goddard dealing with the subject of the college man in dentistry, which subject also occupied considerable space in our April issue. As we regard the question under discussion a most important one, and as Dr. Goddard has evidently misunderstood at least one fundamental element in our statement of policy with regard to it, we take the liberty of attempting to clear up any further misapprehension as to our view of the matter.

Dr. Goddard says: “Dr. Kirk claims that a high-school course is a sufficient preparation for the dental course, and that a college course, while desirable on general principles, is neither essential nor important, and that no time allowance should be made for it in the dental course.”

The statement quoted is misleading. We still contend that under present educational conditions a completed high-school training is a sufficient preparation for the dental professional course, and as evidence thereof we have the fact before us that the very great majority of men who are now “the dental profession” have had no more than a complete high-school preparation, and most of them less than that. We have nowhere said that a college education was not important even as a preparation for dentistry. Dr. Goddard is dealing with a special case, the selected curriculum of one of the courses in his own university, a curriculum framed for and adapted to the training of men to fit them for entrance upon professional study in medicine; and so far as his special case in point is

concerned we agree with him absolutely. Indeed, our editorial in the April Cosmos specifically contends for a selected curriculum of preparatory training especially adapted to the ends of dental education. But when we speak of "a college training" as desirable or essential as a preparation for dental training we are using a general term which covers a variety of curricula, and we contend that it is wrong—because wasteful of time and energy and working in the wrong direction—to demand a college training in purely cultural studies as a preparation for dentistry; and further, that it is impossible to substitute any portion of the dental curriculum or grant a time consideration for such preparatory work. A dentist is not to be made by training in language, history, or mathematics, but, having such training, is a more scholarly man and sometimes a more polished gentleman—features which contribute to his efficiency and acceptability as a member of society. But to become a dentist, in addition thereto he must perforce take the training of the dental curriculum, and no part of his cultural studies or the results thereof can be substituted therefor, if he is to be a dentist worthy of the name.

We think Dr. Goddard will agree with the position here stated. With his plea for the recognition of the attainments of the college graduate who has taken the special biological training which the leading universities offer as preparatory to the medical course we are in hearty accord. There is not only no reason why a time allowance of one year on the dental course should not be given to such college graduates, but, on the contrary, every reason why it should. It is true, as Dr. Goddard contends, that the training in chemistry, physics, biology, bacteriology, histology, microscopic technique, and some other branches given in the biological medical preparatory courses of most universities is infinitely more thorough and extensive than is generally given in dental schools; and it is just that kind of course that is sadly needed by the dental student as a foundation for his professional training, constituting a training in which the average dentist is lacking.

We hope the National Association of Dental Faculties will see the wisdom of admitting graduates of a standard biological course to at least one year of advanced standing in the dental course, as is already done in medical schools with benefit to the educational fitness of their graduates. Such a provision in dentistry would not only improve the character of the dental graduate, but would be an incentive to better preparation upon the part of dental matriculates.

BIBLIOGRAPHICAL.

THE MYCOLOGY OF THE MOUTH: A TEXT-BOOK OF ORAL BACTERIA. By KENNETH WELDON GOADBY, D.P.H. Camb., L.R.C.P., M.R.C.S., L.D.S. Eng., Bacteriologist and Lecturer on Biology, National Dental Hospital; Senior Dental Surgeon, Seamen's Hospitals; Honorary Lecturer on Hygiene of the Mouth, London School of Tropical Medicine; late Demonstrator of Practical Dentistry, Guy's Hospital Dental School. With illustrations. London, New York, and Bombay: Longmans, Green & Co. 1903.

The author has adopted the term mycology as inclusive of the micro-organisms found in the mouth from the fact that "species belonging to higher orders than bacteria or schizomycetes" are also recognized in the oral cavity.

In dealing with his topic the author has conveniently divided it into departments which are placed in logical sequence as follows: Classification. Morphology. Biology. Sterilization. Methods of Observing Bacteria. Susceptibility and Immunity. Pathogenic Bacteria of the Mouth. Bacteria of Dental Caries. Bacteria in Tooth-pulps. Dento-Alveolar Abscess. Pyorrhea, etc.

Each section of the work is clearly elaborated, and the methods of bacterial study are stated in such form and manner as to make a lucid impression upon the student's mind. The classification and description of disease-producing bacteria of the oral cavity are excellent. The work throughout bears the marks of study and experience and of much technical skill, and we know of no similar

book which so satisfactorily fulfills the conditions of a text-book suitable for dental students as this one.

SUCCESS IN DENTAL PRACTICE: A FEW SUGGESTIONS RELATIVE TO THE MOST APPROVED METHODS OF CONDUCTING A PRACTICE. By C. N. JOHNSON, M.A., L.D.S., D.D.S., Professor of Operative Dentistry in the Chicago College of Dental Surgery, Editor of the *Dental Review*, Author of "Principles and Practice of Filling Teeth." Pp. 150. Price, cloth, \$1.25. Philadelphia and London: J. B. Lippincott Co. 1903.

Dr. Johnson has again placed the dental profession under obligations to him for the production of a thoroughly practical and useful book, this time in a field which, as far as we know, is quite unoccupied. We have no lack of literature dealing with the science and art of dentistry, but hitherto little or nothing of a practical nature has been published which will serve as a guide to young men entering the field of dental practice, and clearly instruct them in right modes of professional living.

Instruction in this department is much needed by graduates beyond that which they receive as a part of their college course. The professional precepts received as an undergraduate too often are forgotten, or fail to make an indelible impression, because they are regarded as of secondary importance to the technical features of the course, which lead directly to class advancement and ultimate graduation. Dr. Johnson's book will fill a sphere of great usefulness to the recent

graduate, whose mind, freed from the anxieties of the final examinations, is then keenly alive to all the suggestions helpful to success as a practitioner, and it is by this class that this little work will be read with the keenest interest and greatest profit.

The book is the work of one who speaks from experience; who has tried the principles which he advocates, and has found them to be right. It bears throughout the stamp of genuineness and a high moral purpose which is as refresh-

ing as it is encouraging, for it rings true and hopefully of a success to be attained only through a fidelity to high professional ideas, and tells in sufficient detail how to win success in that way even in the face of a discouraging environment of dental commercialism and quackery. We wish that every recent graduate could absorb the lessons which the book teaches and have faith to follow its guidance, for it is a professional ethical tract of the first magnitude, with a mission for the uplifting of dental practice.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Le Progrès Dentaire*, Paris, June 1903.]

EXPERIMENTAL RESEARCHES WITH ADRENALIN. BY DRs. BOUCHARD AND CLAUDE.

In a communication to the Académie des Sciences (*Revue Scientifique*) Drs. Bouchard and Claude present the result of their investigation as follows:

(1) The fatal dose of adrenalin to rabbits, when injected intravenously, varies from one to two milligrams per kilogram of body weight.

(2) Death seems to be due to nervous and to cardio-pulmonary disturbances. The nervous phenomena in their simplest expression are characterized by paralysis of the posterior extremities; in the more aggravated cases by tonic and clonic convulsions with opisthotonos and mydriasis. The cardio-pulmonary disorders are characterized at first by accelerated respiration, which finally decreases until death ensues.

(3) It is possible to diminish the susceptibility of animals to adrenalin, and to induce a degree of tolerance permitting the administration of toxic doses.

(4) Doses which when injected intravenously bring about death do not produce any disturbance when injected under the skin or into the peritoneum. Intra-peritoneal injections are followed by glycosuria of marked intensity even though the dose injected be very small.

[*Schweizerische Vierteljahrsschrift für Zahnheilkunde*, Zurich, April 1903.]

GENERAL ANESTHESIA WITH ETHYL CHLORID. BY M. J. REBOUL, NÎMES, FRANCE.

Dr. M. J. Reboul (*Revue médicale*) has used ethyl chlorid as a general anesthetic in more than five hundred cases. He states that by means of this agent anesthesia is easily induced, and that patients do not experience any unpleasant sensation. It should be given in small doses, 5 c.c. every five minutes, and the total quantity administered should not be greater than 25 c.c. In children and old people the dose should be half the quantity recommended for the average adult.

The administration by means of a compress is the simplest and most convenient method. It is recommended that air should be excluded. The transmission of an intensely cold sensation to the hands of the operator from the evaporation of the ethyl chlorid in the compress occurs simultaneously with the beginning of the anesthesia; two or three minutes afterward the anesthesia is complete. The anesthesia disappears upon the removal of the compress, but this period is followed by one of analgesia, during which, although at this time the patient is not fully unconscious, surgical operations can be performed without his being aware of it.

Dr. Reboul has not observed any unfavorable symptoms consequent upon ethyl chlorid

anesthesia, and feels that it is a reasonably safe agent for operations not lasting over half an hour. For operations of longer duration, ethyl chlorid should be followed by ether or chloroform, as by this means the period of excitement produced by the anesthetic is avoided.

[*Le Revue de Stomatologie*, Paris, May 1903.]

THE INFLUENCE OF HYSTERECTOMY UPON THE DENTAL ORGANS. BY DR. GALIPPE.

In a communication to the *Société de Stomatologie*, Dr. Galippe refers to the changes which occur in women after hysterectomy, and describes a particular case in which, after the performance of the operation, and concomitant with hepatic disorders, the teeth, besides becoming friable, assumed a dark yellow coloration, and the upper and lower incisors and canines underwent rapid dissolution. The patient was put under appropriate treatment, and in a short time the phenomena subsided, the teeth regained their natural color, and the erosion came apparently to a standstill. These phenomena the author attributes to perverted nutrition. Curatula and Tarolli have found that hysterectomy in dogs is followed by a retention of phosphates, an observation which has been confirmed by Pinzani. This phenomenon Galippe believes to be the result of insufficient oxidation of organic phosphorus. The author examined the patient before and after the operation, and feels certain that the teeth were the seat of physical and chemical changes.

[*Dental Record*, London, May 1903.]

CUTTING-EDGE MOLARS AND BICUSPIDS. BY WALTER WHITEHOUSE.

After several years' experience the author has confirmed his previous conjecture that a more or less sharp cutting-edge in lower dentures, meeting the flat surface of the upper molars and bicuspid, would be more efficacious for mastication than the usual somewhat flat surfaces meeting together, which crush rather than disintegrate food. Mr. Whitehouse has had several opportunities of trying this method, and patients that have been wearing plates thus constructed speak of them with distinct approval. The most important advantages claimed for this method are that the lower sharp teeth cut and disintegrate meat better, that there is more room for the tongue, and no overhanging ledge for the tongue to touch against and disturb the lower denture. It also enables a "raised bite"

to be more quickly and easily adjusted by grinding the narrow lower teeth, which still retain their cutting properties, in contrast to the flat surfaces which are produced when the ordinary molars and bicuspid are ground, destroying their utility.

[*Dental Summary*, May 1903.]

ANNEALING GOLD FOIL. BY J. R. HALAHAN, CINCINNATI, OHIO.

If pure gold foil be exposed to the atmosphere for any length of time, or if brought in contact with certain gases, it gathers upon its surface an imperceptible film, and this, while not affecting the purity of the substance itself, interferes with its cohesion. To drive off this gas and thereby restore the cohesive properties of the gold we resort to annealing.

The author does not believe in annealing gold over an alcohol or gas flame, as it is very difficult to secure purity in either, and further because it is almost impossible to pass the gold through a flame in such a manner as to anneal all portions of a strip or pellet evenly, consequently each layer of gold will have different cohesive properties.

A great improvement over this use of the flame may be obtained by arranging a platinum tray over a flame and heating the gold thereon. In the electric annealer we have an ideal heat for annealing purposes; the author says, however, that this annealer, as prepared for the market gives the degree of heat best adapted, probably, to light foils, and he suggests that it would be a great improvement if, with the assistance of a rheostat, the annealer were capable of giving a wider range in the intensity of the heat.

[*British Dental Journal*, May 15, 1903.]

NUTRITION, RICKETS, AND DENTAL DEFECTS. BY J. KINGSTON BARTON.

The author has carried out a series of experiments originating from the thought that possibly the rickety condition induced in children by improper feeding in infancy, and especially the imperfect permanent teeth resulting therefrom, might be similarly induced in very young calves by rearing them under conditions imitating those referred to. He found that calves fed on separated fresh milk and a patent calf-food much used by farmers would either die in a few weeks' time or else lose considerable weight. In making sections of the bones and joints of such calves the investigator did not find the changes that might have been expected in early rickets, but a very marked difference was seen in the

amount of internal fat and in the amount of blood distributed to the growing parts of the bones.

The author was unable to gain from his experiments any light on the question why hand-fed infants have such defective permanent teeth; in order to investigate this problem upon calves the animals would first have to be fed as long as possible on the artificial food referred to, and then to be kept until they were fully grown in order to see whether the teeth had been injured by the improper feeding at the early stage of life. This plan is impracticable for sufficiently obvious reasons.

Although not absolutely precise, these experiments are very important and interesting, as they clearly show that the practice of artificial feeding is decidedly injurious to the lower as well as to the higher forms of life, and further because they open up a new method for ascertaining the direct cause of certain dental phenomena related to the question of the improper feeding of infants.

[*International Dental Journal*, Philadelphia, May 1903.]

ASEPSIS AND THE STERILIZATION OF INSTRUMENTS. BY SAMUEL A. HOPKINS, BOSTON, MASS.

After referring to the possibility of transmitting the germs of tuberculosis, syphilis, and other diseases by means of unclean instruments, and after presenting in a most interesting form the question of asepsis as related to the practice of dentistry, the author recommends that instruments be boiled in water to which a pinch of washing soda has been added to prevent rusting. Fifty minutes will destroy any bacterium likely to be found in the mouth. It will not, however, always destroy spores, which are extremely resistant to heat and to chemical agents. Spores, however, may be ignored, for two reasons: First, they are only developed in old culture media after the chief ingredients which nourish the microscopic plants have been exhausted from the soil—and in the mouth we have few such conditions. Secondly, the coccus forms which predominate in the mouth do not produce spores. If spores develop, it will generally be because the instruments have been laid away for several days before sterilizing. Dental instruments which cannot without injury be submitted to boiling water can be sterilized quickly in a formalin oven. Instruments which the author kept in an oven for ten minutes showed no growth at the end of twenty-four hours. When placed in bouillon

tubes a slight growth was noticed at the end of forty-eight hours. Similar instruments not sterilized showed distinct growth in twelve hours and profuse growths of many varieties in twenty-four hours. Instruments kept in an oven for fifteen minutes showed no growth. Fifteen minutes may therefore be considered effectual.

The author says that before submitting to the germicidal action of formalin, the instruments should be made dry and clean, since formalin will not penetrate deeply, nor will it prove effective on wet surfaces. The office itself should be sterilized from time to time by means of burning formalin. For the sterilization of the hands, Dr. Hopkins recommends the use of sublamin, which is almost as powerful as corrosive sublimate, but does not irritate the hands. It dissolves well in water, it can be used with soapsuds (which is not true of the sublimate), it penetrates deeper, and it leaves the hands smooth.

[*Deutsche Monatsschrift für Zahnheilkunde*, Leipzig, May 1903.]

ROOT-PERFORATION AND ITS TREATMENT. BY R. PARREIDT.

The literature on root-perforation and its treatment is very small, the most important references to the subject being those of Evans ("A Practical Treatise on Artificial Crown and Bridge Work," Philadelphia, 1900), Girdwood (*International Dental Journal*, June 1897), and Morgenstern (*Wiener Zahnärztliche Monatsschrift*, January 1901).

Root-perforation is not easily diagnosed, and therefore many cases are overlooked or erroneously treated for other disturbances. The author describes the methods advocated by the writers previously alluded to, quoting *in extenso* Morgenstern's technique, with which perhaps only a small minority of the profession are acquainted. In cases of recent perforation this author uses warm water to arrest the bleeding incident to the injury of the underlying soft tissues. The root is then washed with a five per cent. carbolic acid solution, and a pledget of cotton saturated in this same solution is placed against the perforation and allowed to remain in position for about ten minutes. The canal is then dressed with the following preparation:

R—Masticis,	3jss;
Etheris,	3j;
Iodoformi,	gr. iv;
Acidi carbolic,	gr. viij.
M. et fiat solutio.	

A stream of hot air is then directed against

the canal and the entrance is sealed up with cement. A few days afterward the filling and dressing are removed, and the canal, after being thoroughly dried, is filled permanently with tin foil. When the perforation is one of long standing the technique differs from the one just described in that the tissue, which usually projects into the root through the perforation, is removed with spoon-shaped excavators after previous cauterization with twenty-five per cent. silver nitrate.

The author then describes a case from practice, and concludes his communication by stating that the prognosis is generally good in cases of recent standing, and that the operator should not attempt to permanently seal the canal until reasonably sure that the closing up of the perforation will not be followed by any inflammatory reaction.

[*Dental Summary*, May 1903.]

TEETH IN RELATION TO DEGENERACY.

BY H. C. RUTTER, COLUMBUS, OHIO.

The author states that of all the stigmata of degeneration none are more characteristic of certain conditions than the teeth. While all parts of the body may under certain conditions present features of abnormal development, nothing appears more uniform and persistent than particular forms of departure from health in the shape, arrangement, and disease of the teeth in certain degenerative results of heredity. Indications of degeneracy are usually observed in the teeth at a very early period. In rickets the eruption of the teeth is usually delayed, and they are irregular in shape and size.

The author classifies rickets, as well as idiocy, scrofula, etc., in the degenerative group of afflictions, as late investigations have shown that these maladies are associated with degeneration and prenatal changes. In rickets the gums are often spongy and bleed so readily that the disease has been confounded with scurvy. In idiocy, cretinism, and feeble-minded children the teeth usually indicate the degenerative condition very early.

The author then quotes Hutchinson's description of the abnormal teeth in the degenerative condition caused by an inherited syphilis. In congenital epileptics, the feeble-minded, and the idiotic the teeth are mostly dwarfed. The size and shape of the teeth, and their position, frequently protruding forward so as to elevate the upper lip and push out the lower lip, give a horrible, grotesque appearance to the degenerate. Many nervous disorders are the direct result of defective teeth, which in turn may have resulted from

some inherited weakness of nutrition. Several well-authenticated recoveries from epilepsy have resulted from treatment of defective teeth, and from his own experience the author is warranted in saying that in nearly all cases the intensity of the disease may be greatly lessened by proper dental treatment.

In concluding, the author states that the most prolific cause, remote or immediate, of insanity, idiocy, epilepsy, and degeneracy, is indigestion; therefore, as defective teeth play such an important part in the production of indigestion, the bond of union between the dentist and the neurologist must of necessity be close. Bad teeth exercise their primary effect in causing neurasthenia and weakness; and secondly, by impairment of digestion, lead to degeneration in the offspring. These degenerate offspring in their turn propagate bad teeth in their children, and in this way a complete cycle is produced.

[*Dental Review*, Chicago, May 15, 1903.]

GERMICIDES: SOME DENTAL USES.

BY ELGIN MAWHINNEY, CHICAGO, ILL.

The essayist presents the results of his investigations with reference to the power of certain germicidal agents. The germicidal action of drugs is efficient in proportion to the number of ions they contain. The dissociation theory of Arrhenius throws much light on this problem. This theory refers to the splitting into ions of certain organic and inorganic acids and salts when in solution. The negatively charged ions are called anions and the positive ones kations. The same principle holds true regarding the germicidal action of drugs. For example, in mercury compounds it is not the amount of mercury in the salt, but the number of mercury ions that determines the efficiency. An alcoholic solution of corrosive sublimate is less potent than an aqueous solution, as in the former slight dissociation occurs.

The author incidentally refers to the action of germicides upon bacterial protoplasm, stating that the inorganic salts of the heavy metals form with protoplasm insoluble compounds. The fatty acid series, the coal derivatives, as phenol, naphthol, guaiacol, cresol, etc., beechwood creasote, salicylic acid, etc., act by coagulating the protoplasm to a greater or less degree. But it must be understood that none of these agents acts in a chemical way, but simply by coagulation, which is a molecular process. They do not enter into chemical combination with the proteid substance. The salts of the metals produce insoluble precipitates and thus pre-

vent greater penetration, and their germicidal power depends upon the degree of precipitability of the different proteids. The aromatic series can scarcely be called germicides. To the aromatic series belong the essential oils, and the above statement with reference to their power of destroying germ life is not in harmony with the result of the investigations carried on by Dr. E. Calvello (*Semaine médicale*) and published on page 164 of the February 1903 issue of the DENTAL COSMOS. That investigator found that emulsions of 9 per cent. oil of cinnamon and 12 per cent. oil of thyme would bring about sterilization of hands previously infected with staphylococcus pyogenes aureus and bacillus coli communis.

Regarding the oxidizing group of agents the author makes a statement in which the reviewer heartily concurs, namely that the failure to get good germicidal results with the oxidizers is due to the fact that they are equally active upon the organic matter of the tissue. There is a fact which is often lost sight of in considering this subject which is of vast importance, which is that in the ap-

plication of germicides to suppurating surfaces one must consider the tissue in which the suppurative process is going on, as nearly all these agents act more forcefully against the cells of the tissue than against the micro-organisms therein.

After alluding to the conditions that must be considered in applying germicides the author presents the results of his investigations on the action of certain germicides upon several forms of bacteria. He found that formalin, sublatin, phenol, sulfonic acid, tricresol, creolin, cresamin, phenece, and chinosol exhibited the greatest degree of germicidal activity. Chinosol, $C_9H_6N.KSO_4$ —prepared by the action of potassium sulfate upon chinolin, the coal-tar derivative—is in the author's opinion the most powerful germicide for the pyogenic variety of micro-organisms. It has, however, as the author states, two objections, namely, that it corrodes steel instruments and has a slight tendency to darken the teeth. It is practically non-irritating, and it is used in solutions varying from 2 to 10 per cent.

PERISCOPE.

The Lightest Metal.—The lightest of metals is lithium, specific gravity 0.59. It is the only known element with which nitrogen will directly combine at ordinary temperature.—*Power and Transmission.*

Painless Application of Corrosive Sublimate.—L. F. Appleman (*American Medicine*) states that when solutions of mercury bichlorid are made with normal salt solution, instead of water, they do not cause the slightest pain when applied to mucous membranes.—*Monthly Cyclopedica of Practical Medicine.*

Formaldehyd.—This antiseptic, disinfectant, deodorizer, and germicide is now quite the general and favorite disinfectant, having in some quarters recently completely displaced the burning of sulfur. Various combinations have been recommended and are actually in use. A mixture of formaldehyd with soap with a little heat produces a disinfectant soluble in water and without odor. Mixing formaldehyd with ammonia produces an odorless combination which is an efficient deodorizer. The use of this combination is recommended by Dr. Alfred Martinet of Paris. *Squibb's Ephemeris.*

Barium Chlorid as a Substitute for Digitalis.—Schaedel (*Berl. klin. Wochenft.*, 1903, p. 278) recommends barium chlorid as an efficient and reliable heart tonic. Given in doses of from 0.02 to 0.05 gm., it is said to increase the blood pressure and to reduce the frequency of the heart's action.—*Amer. Journ. of Pharmacy.*

A Cause of Failure in Dental Operations.—Many thousands of dental operations fail because they are not indicated in the places where they are employed. There seems to be a lack of discrimination on the part of many operators and an inability to select for each individual case the methods and the materials best suited to its conditions. Operators are either ignorant of the individual qualities of their materials and the conditions indicating their use, or else are guided (as they may also be in the purchase of their materials) by the financial consideration involved in each transaction. Thus many gold fillings are placed in cavities where amalgam would give better results, and bridges without number are placed on piers unable to bear them.—F. L. PLATT, *Pacific Dental Gazette.*

How to Dry Small Instruments.—After using some of the more complicated instruments which it may be impossible to dry very thoroughly after they are washed, they may be dipped in alcohol, which will absorb the remaining water, or they may be placed in an oven for a few minutes. The latter method is probably the better of the two.—*Internat. Journ. of Surgery.*

Instrument Sterilization.—If cutting instruments are to be boiled, it is always best to continue the boiling for not over three or four minutes, as it blunts the instruments badly. A preferable way of disinfecting them is to wash them well with soap and water, place them in pure carbolic acid for ten or fifteen minutes, remove them with forceps, and place them in alcohol.—*Internat. Journ. of Surgery.*

Arsenic a Normal Element of the Living Cell.—Armand Gautier found (says Gabriel Bertrand, in *Bulletin méd.*) that small quantities of arsenic were present in the thyroid gland and other cellular elements. The writer, in a series of experiments on animals, confirmed this fact and concludes that arsenic is a normal element of the living cell, and is to be found in all animals and in all organs.—*Monthly Cyclopedia of Practical Medicine.*

The Tooth-brush a Therapeutic Medium.—To check the ravages of disease in the mouth, caries of teeth, diseased gums or periodontal membrane, waste of alveolar process, loosening and loss of teeth, the effect of local causes—mostly unhealthy environments—we must resort to and rely chiefly upon the frequent, systematic use of the tooth-brush. It is, of all remedies, the most effectual and trustworthy.—B. F. ARRINGTON, *Internat. Dental Journal.*

Diversified Talent Requisite in the Dentist.—We have often contended that a more diversified talent is required for the successful practice of dentistry than is demanded by any other profession. In the legal, medical, or clerical profession the one all-important consideration, aside from the moral and social requirements which should properly be considered as the foundation of the structure, is that of a well-trained mind. In dentistry the requirements, apart from the aforesaid foundation, are three-fold—intellectual, mechanical, and artistic—absence of, or insufficiency in any one of these making it impossible for one to attain to a high professional position.—J. CHASE, *Dental Hints.*

A Rubefacient.—Etherial tincture of capsicum is recommended as a good remedy for local application in gout, in muscular and chronic forms of rheumatism, and in some forms of bronchitis. The following formula is recommended by Sir James Sawyer:

Etherial tinc. capsicum,	
Solution of ammonia,	
Turpentine,	
Linseed oil,	equal parts.

—*Medical Times.*

Lingual Extension of Lower Plates.—Remember, no matter how deep the lingual side of the lower jaw, not to extend the plate any lower than it ceases to be lifted when the tongue is raised to the palate. Remember that weight is not an essential factor in the lower denture, nor is lack of weight an essential factor on the upper jaw. If the denture be properly fitted, has a fair adhesion, and is properly articulated, the patient does not realize weight.—L. P. HASKELL, *Dental Review.*

Etching on Metals.—To etch on metals, take one-half ounce of nitric acid and one ounce of muriatic acid. Mix, shake well together, and it is ready for use. Cover the place you wish to mark with melted beeswax; when cold, write your inscription plainly in the wax clear to the metal with a sharp instrument; then apply the mixed acids with a feather, carefully filling each letter. Let it remain from one to ten minutes, according to appearance desired; then throw on water, which stops the process and removes the wax.—*Power and Transmission.*

Mouth-washes.—As poor digestion and other troubles may result from insufficient care of the teeth and mouth, W. H. Trick (*Dublin Journ. of Med. Science*, December 1902) enumerates the essentials of a good mouth-wash. It must be non-poisonous, non-irritating, deodorizing, antiseptic, and refreshing. It must also be neutral in reaction, alkalies attacking the organic constituents of the teeth, and acids disintegrating the mineral constituents. It is, of course, not necessary to destroy all the micro-organisms of the mouth, a result that could be gained only by very powerful substances, but fermentation and decomposition should be arrested. Of substances which have been found to be injurious to the teeth are weak solutions of corrosive sublimate, cream of tartar, salicylic acid, alum, boric acid, thymol, and carbolic acid.—*Monthly Cyclopedia of Practical Medicine.*

Bone-Implantation.—Professor Cornil of Paris read a paper before the Section of Pathology of the Fourteenth International Medical Congress in which he stated that the investigations of Bartels have demonstrated that dead and living pieces of bone are not equally efficacious in bone-implantation, and that it is premature to infer that the living pieces remain alive. Both implantations were replaced by fresh bony tissue, but the living pieces were more valuable for closing up bony cavities because the granulations were more active and abundant. This fact Bartels has demonstrated in the cranial bone of the dog and other animals.—*Medical News*.

Orthoform.—This synthetic local anesthetic constituted like cocain has not been commented upon much during the past year except in the way of repetitions. Its internal administration has lately been attempted. Drs. A. Einhorn and R. Heinz, of Munich, Bavaria, have been using it successfully in round ulcer and cancer of the stomach. Drs. Bouveyron and Siraud, of Lyons, have successfully used it in the headache accompanying syphilis. They administered as much as two to three grams (30.9 to 46.3 grains) a day, dividing it up into from four to six powders. They differentiate the cases and stipulate how each should be treated.—*Squibb's Ephemeris*.

Preparing a Cavity for Porcelain Inlays.—It is indispensable that the cavity should be shaped so that the matrix can be perfectly made and withdrawn without changing the shape in ever so slight a degree. To this we need not hesitate to sacrifice frail walls, especially upon occlusal surfaces, as the crowns of molars and bicusps and the palatal walls of upper incisors. In all approximal cavities space must be gained by wedging or filing. At all occlusal surfaces the walls of the cavity must be at right angles, and thin edges should be avoided as far as possible. All the walls of the cavity should be as nearly at right angles as circumstances permit. Occasionally some decayed dentin can be allowed to remain until the completed filling is ready to be set, if its premature removal would necessitate undercuts, but usually every particle of decay can be removed with advantage in the first preparation of the cavity. All the edges should be clearly defined and well polished, that it may be possible to burnish the edges without injury to the matrix. It is well to polish also the interior of the cavity, as a smooth surface facilitates the removal of the matrix.—N. S. JENKINS, *Internat. Dental Journal*.

Therapy of Pulp-Hypertrophies.—In cases of hypertrophy, the pulp may be either simply amputated with a pair of fine scissors or a pointed knife in the depth of the pulp-chamber, arsenic paste then being applied to cause necrosis of the remaining pulp, or the arsenic paste can be applied to the crown portion in order to destroy by necrosis the entire tissue. But there is no serious error, in my opinion, in avoiding the use of arsenic altogether, and simply cutting off the top of the hypertrophy and capping the stump.—VON RÖMER, *Internat. Dental Journal*.

[The method of packing crystals of iodine between the pulp and the walls of the pulp-chamber, as recommended by Dr. Jas. Truman, can be relied on to give equal or better results in such cases.—ED.]

Antiseptics in Hand-Disinfection.—Absolute sterility of the hands is impossible by any method. There is no royal road to sterilizing the skin; nothing takes the place of long and vigorous mechanical scrubbing. The longer the hands are scrubbed under aseptic precautions, the nearer the approach to sterility. The use of antiseptics on the skin is at least questionable; under the usual conditions it is distinctly harmful. When the true value of antiseptics is understood we will have cleaner hands, due to more conscientious scrubbing. The use of rubber gloves, while not ideal, is the nearest approach to it. The operator whose hands perspire freely ought to wear gloves in every case, regardless of all objections to them.—E. R. MCGUIRE, *Amer. Medicine*.

A Case of Hematophilia Illustrating the Value of Calcium Chlorid as a Local Styptic.—T. W. Parry, M.B., reports (*Lancet*, February 21, 1903) a case of hematophilia occurring in a boy aged seven years: The bleeding came from the mouth, the blood welling up between the lower left first permanent molar and the temporary molar in front of it. The bleeding lasted for four days, during which time the interdental fissure was plugged as efficiently as possible with minute pledgets of wool soaked in various styptics—alum, tannic acid, turpentine, iron perchlorid, and suprarenal extract. But the bleeding was not checked until calcium chlorid was employed, in the form of thirty grains to the ounce solution; it then ceased at once and did not return. Calcium chlorid is cleanly, and further does no harm if swallowed, but on the contrary is the very drug one would prescribe in cases of hematophilia.—*New York Med. Journal*.

Cement Anchorage for Amalgam Fillings.—Remove carious dentin and properly prepare the cavity. Line the cavity with thin cement, being careful not to use an excess. Place a piece of amalgam in the cavity and press to place, forcing it into close contact with the cavity walls. This will crowd out any excess of cement. Pack more amalgam until the margins of the cavity are neared, then clear them of any cement, so that only amalgam will be in contact with them. Then finish the filling as usual, applying a matrix, if necessary. The cement, besides securely anchoring the filling, which is of great value in strengthening a frail tooth, also prevents the dark discoloration so often seen in teeth filled with amalgam.—McCLAIN, *Internat. Dental Journal*.

Definition for Articulation.—The four positions of the lower jaw in its relation to the upper, from a strictly dental standpoint, are occlusion (being the relation desired in taking the "bite"), right lateral occlusion, left lateral occlusion, and incisal occlusion. The combination of these four positions in action constitutes articulation.—P. B. McCULLOUGH, *Internat. Dental Journal*.

[The generally accepted meaning of the term occlusion implies the relations of the upper to the lower teeth as in the act of closing the mouth, and therefore can refer only to the position of the teeth resulting from the close approximation of both dentures. In view of the foregoing, the use of such expressions as "right lateral occlusion," "left lateral occlusion," and "incisal occlusion" is not only misleading, but also incorrect—as they do not imply what perhaps the author intended them to signify, namely, the various movements of the mandible in the act of mastication.—ED.]

Chemical Nature of Asbestos.—There are two minerals mined and sold under the name of asbestos. One is a variety of amphibole, a calcium and magnesium silicate; the other is a variety of serpentine, known as chrysotile, which is a hydrous magnesium silicate. The latter is superior in strength and elasticity of fiber, though each has about equal resistance to heat. Chrysotile is usually greenish-white to greenish-yellow in color, of silky luster and composed of fibers easily separable. They seldom exceed two and one-half inches in length. The fibers of the amphibole variety are sometimes three feet in length. They lack the silky luster of the chrysotile, rather resembling flax in appearance. The fibers of the amphibole variety

lie parallel with the schistose structure of the rock in which it occurs, and chrysotile, occurring in small veins, lies at right angles to the strike of the vein. The only known deposits of merchantable chrysotile are in Canada, Vermont, Wyoming, and California.—*Power and Transmission*.

The Suprarenal Gland as a Hemostatic.—No fact is more conclusively proved than the remarkable hemostatic effect of the extract and active principle of the suprarenal glands, and yet it seems strange that they should still be comparatively neglected by the profession at large. They are more effective than the salts of iron and leave behind no filthy mess of blackened, coagulated blood. Unlike the actual cautery, their application is painless and causes no destruction of the tissues. To sum up the virtues of suprarenal gland as an hemostatic in a word, it is ideal. It has proved valuable in nose and throat surgery, has stopped persistent bleeding of every form in which the leaking vessels are not so large as to make ligation immediately imperative. Indeed, we may well venture to term it one of the most valuable biological products that science has of late years discovered, and it is not without a certain amount of surprise that we realize how comparatively small a place it has as yet assumed in that branch of emergency work which has to deal with sudden and dangerous hemorrhage—which, as we well know, often occurs in regions and under circumstances in which direct surgical means are either unavailable or impossible to adopt.—*Internat. Journ. of Surgery*.

Infections of the Newborn.—Dr. S. M. Hamill of Philadelphia, said that the infections of infancy should be classified on a bacteriological basis. He described six cases which had been studied with Dr. W. R. Nicholson of Philadelphia; in each instance the death of the infant had been due to an excessive bacterial invasion. Streptococci, staphylococci and colon bacilli had been found in various organs. These germs had been detected in the dust of the rooms in which the infants were confined, in the bedding, in various toilet articles, in the mothers' clothes, and in the bath-water of the infants. Poorly trained and careless nurses were probably responsible for most of these infections. In regard to the preventive treatment, Dr. Hamill said that general aseptic technique of the maternity hospital staff should be insisted upon; only regular attendants should be admitted to the wards; these should wear

special gowns and should wash before and after handling the infants. The children should be in a separate ward from the mothers and under the care of a careful and well-trained nurse. The breasts of the mothers should be watched and the mouths of the infants carefully cleansed.—*Medical News*.

Physiological Action of Boric Acid.—The physiological action of boric acid and its salts is a subject upon which we are urgently in need of precise information, in view of their extensive employment as preservatives in articles of food. Dr. Merkel of Nuremberg has just published the results of a series of observations undertaken by him on the internal administration of the acid. He gave from fifteen to thirty grains in aqueous solution to a number of patients suffering from slight ailments, for periods varying from two to eight days, and obtained unequivocal evidence of gastro-intestinal irritation. The symptoms were excessive formation of gas in the stomach and intestines, with eructations, colic, epigastric pain, and diarrhea. Invalids proved much more sensitive to its influence than healthy individuals, the latter being able to take moderate doses of the acid without manifest inconvenience. The moral is that boric acid is not suitable for use as a preservative in articles of food intended for consumption by invalids or by the young, and it is particularly objectionable in milk, since it has to be used in comparatively large quantities and the adulterated article is likely to be taken by those persons in whom it is likely to cause more or less distressing digestive disturbances.—*Med. Press and Circular*.

True Value of the Arsenical Antidote.—Dr. L. De Busscher (*Arch. internat. de Pharm. et de Thérap.*, vol. x, p. 455) presents a series of experiments on animals which cast a serious doubt upon the true value of the ordinary antidote for arsenic, a mixture of precipitated ferric oxid and magnesia. The author first determined the minimum toxic dose of potassium arsenite in a rabbit. He then poisoned a dog with a given amount of this substance, and gave the animal the ordinary antidote for arsenic immediately afterward. He found that the antidote did not save the life of the animal, but that it did prolong the duration of the symptoms of poisoning. If the antidote was mixed with the poison and the two were administered together, the result was not any better. Fowler's solution is more poisonous than the anhydrid, and it was also used in these ex-

periments. The antidote not only proved totally useless in poisoning with Fowler's solution, but seemed to have increased and accelerated the symptoms of intoxication. The author concludes from these experimental data that the value of the ordinary arsenical antidote is very doubtful. It is apparently useless in poisoning from potassium arsenite, and directly injurious in poisoning from Fowler's solution. The author believes that the mechanical removal of arsenic from the stomach offers the best means of saving the patient in cases of arsenical poisoning. The stomach-pump proved ineffectual; the best method was found to be the administration of an emetic, especially if the stomach had previously been filled with food.—*American Druggist*.

Salicylic Acid in Strawberries.—The strawberry season is at hand, and this delicious fruit is not without its advocates as to its advantages in rheumatism. Indeed, some have gone the length of saying that strawberries may not only be taken with impunity by the rheumatic and gouty, but with distinct advantage, if not relief. It is a somewhat curious coincidence, therefore, that in the strawberry the presence of salicylic acid, which is, of course, a specific in acute rheumatism, has been definitely established. As a matter of fact, salicylic acid would appear to be a normal constituent of most fruits. At any rate, this acid has been found not only in the strawberry but in grapes, apples, plums, oranges, and cherries, although the amount is probably less than one milligram (1-64th of a grain) per kilogram (two pounds) of fruit. It is hardly possible, therefore, that the strawberry should have any specific medicinal effect attributable to the salicylic acid present. A few weeks back there was recorded in our columns a formidable case of sprue in which strawberries in the diet appeared to act as a specific in the disease. As is well known, most fruits possess anti-scorbutic properties and contain salts which readily become converted into carbonates in the system, thus tending to maintain an alkaline condition and preventing the formation of acid deposits. The fact, however, that salicylic acid exists normally in fruits is of interest in connection with the use of salicylic acid as a preservative in jams. It is possible that some magistrates may regard this natural occurrence of the acid in fruit as a plausible defence in those cases in which proceedings are taken for the addition of small quantities of the preservative.—*Lancet*.

Physiological Importance of Abundant Light.—The habit of keeping the window-shades down, which is so common a practice even when there is no direct sun-glare on the window, is a direct setting at naught of physiological principles, which teach the importance to health of both body and mind of an abundance of light. Sir James Crichton-Browne, in an address on "Light and Sanitation," delivered at the jubilee conference of the Manchester and Salford Sanitary Association, said: "I have spoken of light as purifying our atmospheric environment and as freeing us from certain superficial parasitic distempers, and I wish now to remind you that it has still more deep and intimate human relations of a sanitary nature; for light is a necessary condition of mental and bodily well-being. Its tonic psychical effects are everywhere recognized. All properly organized men and women love the light, and it is not merely to children that darkness brings with it a sense of powerlessness, danger, and

alarm. Essential for all the purposes of life, for the supply of oxygen on which existence depends, light is a universal stimulus. Falling on the eye, it sets up in the brain functional activities associated with intellectual and emotional states, and attempts have been made to discriminate the psychical effects of its different elements, and to employ colored light in the treatment of mental disorders. These attempts cannot be said to have been hitherto very successful, but still it is curious to note that many independent observers—indeed, I believe, all observers who have written on the subject—have arrived at the same conclusion: that the blue rays have a depressing and the red rays an exciting effect on the brain. But whatever the therapeutic values of the different rays of light may be, white light, Heaven's own mixture, is the normal psychical atmosphere, and variations in its intensity have probably widely diffused constitutional effects."—*New York Med. Journal.*

OBITUARY.

DR. WILLIAM CHAMBERS.

DIED, at Anaheim, Cal., March 25, 1903, Dr. WILLIAM CHAMBERS, in his seventy-fifth year.

Dr. Chambers was born in Philadelphia, Pa., and studied dentistry under the tutelage of Dr. William R. White. He afterward went to Bogotá, U. S. of Colombia, S. A., where he enjoyed a lucrative practice for thirty years, and returning to Philadelphia in 1881, he acquired his diploma at the Pennsylvania College of Dental Surgery and retired from practice. He made Philadelphia his home till 1901, then with his wife and son, Charles J., he moved to his ranch in California.

Dr. Chambers won the regard of all who knew him by his sterling worth, courteous demeanor, and constant Christian character. Dr. Louis Jack has said of him: "He was an intelligent, industrious, and much-interested student; he therefore soon acquired considerable ability in both departments of practice. His marked personal qualities were affability and deferential manner combined with fine courtesy. These characteristics made him acceptable to the people with whom he became associated in South America."

There survive him his wife, a daughter, Mrs. J. L. Wright of Des Moines, Iowa; and two sons—Dr. William M., Mexico, and Dr. Chas. J., Anaheim, Cal.

W. M. C.

DR. WILLIAM SELLERS.

DIED, at New Boston, N. H., May 8, 1903, Dr. WILLIAM SELLERS, from acute jaundice, aggravated by heart failure.

Dr. Sellers was born at Guysboro, Nova Scotia, April 1, 1832. In 1862 he entered the office of Dr. W. W. Russell, and after an apprenticeship lasting a little over a year, opened an office in Haverhill, Mass.

Dr. Sellers was a prominent local citizen for nearly half a century. Besides being actively engaged in dentistry he was also prominent in politics. In later years he devoted much of his time to the practice of prosthetic dentistry, his work always bearing the mark of his great artistic skill.

He was married in 1865 to Miss Philantha R. Whipple, who, with a daughter, Mrs. F. C. Davis of Haverhill, Mass., and a son, Mr. Wm. H. Sellers of Boston, survives him.

SOCIETY NOTES AND ANNOUNCEMENTS.

DENTAL SOCIETY MEETINGS: July 1903.

MAINE DENTAL SOCIETY. Kineo, Moosehead Lake. Three days: July 21st, 22d, and 23d.

MICHIGAN DENTAL SOCIETY. Petosky, Mich. Date not yet announced.

NATIONAL DENTAL ASSOCIATION. Asheville, N. C. July 28th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. Asheville, N. C. July 24th, 25th, and 27th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. Asheville, N. C. July 24th.

NATIONAL ASSOCIATION OF COLORED DENTISTS. Washington, D. C. Three days: July 2d, 3d, and 4th.

NEW JERSEY STATE DENTAL SOCIETY. Asbury Park. Three days: July 15th to 17th.

PENNSYLVANIA STATE DENTAL SOCIETY. Wilkesbarre. Three days: July 7th to 9th.

RHODE ISLAND DENTAL SOCIETY. Newport. July 14th.

SOUTH CAROLINA STATE DENTAL ASSOCIATION. White Stone Lithia Springs. July 21st.

TENNESSEE STATE DENTAL ASSOCIATION. Lookout Mountain. Three days: July 23d, 24th, and 25th.

VIRGINIA STATE DENTAL ASSOCIATION. Hot Springs, Va. July 21st, 22d, and 23d.

WISCONSIN STATE DENTAL SOCIETY. West Superior. July 21st, 22d, and 23d.

INERS. Lookout Mountain. July 23d, 24th, and 25th.

VERMONT BOARD OF DENTAL EXAMINERS. Montpelier. July 14th.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS. Superior. July 20th.

NATIONAL DENTAL ASSOCIATION.

THE National Dental Association will meet in Asheville, N. C., Tuesday, July 28, 1903.

Preparations are being made for one of the best meetings in the history of the Association. The section officers are preparing a program which, from a scientific and practical standpoint, will be difficult to excel.

A special feature will be the clinics, of which the following is a partial program:

1. "Hygienic Fillings," Dr. Levi C. Taylor, Hartford, Conn.

2. "Sharp Seamless Crown Outfit," Dr. S. Eldred Gilbert, Philadelphia, Pa.

3. "Something in Porcelain Work," Dr. R. C. Brophy, Chicago, Ill.

4. "Advantages of the Hollow Post Combined with the Inlay Principle for Cantilever and Bridge Abutments," Dr. Garrett Newkirk, Los Angeles, Cal.

5. "Modern Porcelain Art, and Oil Colors, as Applied to Dental Prosthesis," Dr. D. O. M. LeCron, St. Louis, Mo.

6. "Pyorrhea Alveolaris," Dr. Wm. H. G. Logan, Chicago, Ill.

7. "Partial Removal and Decalcification of Cementum in Treatment of Riggs' Disease," Dr. Howard T. Stewart, Memphis, Tenn.

8. "A Demonstration of the Application of Dr. Edward H. Angle's Fracture Bands in Fractures of Maxillæ, Superior and Inferior," Dr. F. Lee Hollister, Wilkesbarre, Pa.

9. "The Cementation of Crowns and Bridges with Gutta-Percha Cement," Dr. Geo. Evans, New York.

10. "Demonstrating the Advantages of an Improved Flask in Investing and Packing

State Board Meetings.

DELAWARE STATE BOARD OF DENTAL EXAMINERS. Wilmington. July 1st.

DISTRICT OF COLUMBIA BOARD OF DENTAL EXAMINERS. Washington, D. C. July 14th.

NEW JERSEY STATE BOARD OF REGISTRATION AND EXAMINATION IN DENTISTRY. Trenton. July 7th to 9th.

NORTH DAKOTA BOARD OF DENTAL EXAMINERS. Grand Forks. July 10th.

SOUTH CAROLINA BOARD OF DENTAL EXAMINERS. White Stone Lithia Springs. July 20th, 21st, and 22d.

TENNESSEE STATE BOARD OF DENTAL EXAM-

Vulcanite Dentures," Dr. J. H. Feagan, Spartanburg, S. C.

11. "Administration of Nitrous Oxid with a New Nasal Inhaler," Dr. Robert J. Cruise, Chicago, Ill.

12. "The Use of Non-Cohesive Gold," Edwin C. Blaisdell, D.M.D., Portsmouth, N. H.

13. "Porcelain Crowns," Dr. Russell Markwell, Galveston, Texas.

14. "Specimens of Porcelain Work and a Method of Making Seamless Gold Shell Crowns," Dr. Paul W. Evans, Washington, D. C.

15. "Porcelain Crowns, Sections and Inlays," Dr. F. J. Capon, Toronto, Canada.

16. "Cavity Preparation in Natural Teeth," Dr. Alfred Owre, Minneapolis, Minn.

17. "A Method of Protecting the Cervical Margin in Cement Fillings," Dr. Burton Lee Thorpe, St. Louis, Mo.

18. "Combination Cohesive and Non-Cohesive Gold," Dr. D. J. McMillen, Kansas City, Mo.

19. "An Improved Modification of the Richmond Crown," Dr. H. Herbert Johnson, Macon, Ga.

20. "Models and Appliances Representing Artificial Vela and Obturators for Cleft-Palate Cases," Dr. R. Ottolengui, New York.

21. "Porcelain Fillings and Furnace Construction," Dr. Wm. Leon Ellerbeck, Salt Lake City, Utah.

22. "Root-Canal Filling, using Sandarac Varnish and Gold Wire Points," Dr. Chas. P. Pruyn, Chicago, Ill.

23. To be announced, Dr. Hart J. Goslee, Chicago, Ill.

24. To be announced, Dr. Rudolph Beck, Chicago, Ill.

25. "Porcelain Inlays," Dr. Wm. Reeves, Chicago, Ill.

26. To be announced, Dr. Joseph Head, Philadelphia, Pa.

27. "Gold Inlay (using Copper Amalgam Matrix)," Dr. H. B. Tileston, Louisville, Ky.

28. To be announced, Dr. Harry P. Carlton, San Francisco, Cal.

29. "Porcelain," Dr. W. A. Capon, Philadelphia, Pa.

30. "Porcelain," Dr. L. E. Custer, Dayton, Ohio.

31. "Some Novel Attachments for Removable Bridge and Metal Plate Work," Dr. B. Holly Smith, Baltimore, Md.

32. "Abutments for Esthetic Crown and Bridge Work," Dr. W. E. Grant, Louisville, Ky.

33. "Some New Things in Gold Work," Dr. A. R. Begun, Des Moines, Iowa.

34. "Replaceable Facings for Crown and Bridge Work, and Repairs," Dr. Emory A. Bryant, Washington, D. C.

35. "Porcelain," Dr. Henry C. Raymond, Detroit, Mich.

36. "Method for Constructing a Continuous Gum Upper Set of Teeth—Table Clinic," Dr. Geo. W. Schwartz, Chicago, Ill.

37. Dr. C. Edmund Kells, New Orleans, will exhibit models showing his method of extracting impacted third molars; he will also give a demonstration in X-Ray Work.

38. "Implantation," Dr. Robert E. Payne, New York.

39. "Porcelain Work," Dr. Wm. K. Slater, Knoxville, Tenn.

40. "Porcelain Inlays," Dr. Thos. P. Hinman, Atlanta, Ga.

41. "Gold Inlays," Dr. C. L. Alexander, Charlotte, N. C.

42. "Oral Clinic on the Management of Children's Teeth; also on the Management of the Mouths of Very Aged People," Dr. J. Y. Crawford, Nashville, Tenn.

All dentists interested in the advancement of the profession should attend this meeting.

All state and local societies should elect delegates who will be sure to attend the national meeting, they being entitled to one delegate for every six of their members.

The usual railroad rates will be had on all roads in the United States and part of Canada—one fare and a third, on the certificate plan.

L. G. NOEL, *Pres.*, Nashville, Tenn.

A. H. PECK, *Rec. Sec'y*, Chicago, Ill.

SOUTHERN BRANCH, NATIONAL DENTAL ASSOCIATION.

THERE will be a business meeting of the Southern Branch of the National Dental Association in the ball-room of the Battery Park Hotel, Asheville, N. C., immediately on adjournment of the National body at first morning session, Tuesday, July 28th. The object of this called meeting is to consider

the election of officers, the time and place of holding the next regular meeting, the reception of delegates to this meeting of the National, and the disposal of other matters of business pertaining to the branch.

L. G. NOEL, *President*,
S. W. FOSTER, *Sec'y*, *So.Br.N.D.A.*

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE National Association of Dental Examiners will meet at Asheville, N. C., July 24, 25, and 27, 1903.

J. P. Root, *Sec'y*.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE National Association of Dental Faculties will convene in the ballroom of the Battery Park Hotel, Asheville, N. C., Friday, July 24, 1903, at 11 A.M.

The Executive Committee is called to meet at the same place, Thursday, July 23d, at 2.30 P.M. Parties having business with this committee are hereby notified to be on hand at this time.

H. B. TILESTON, *Chairman*,
S. W. FOSTER, *Sec'y*,
Ex. Com. N.A.D.F.

INDIANA STATE DENTAL AS- SOCIATION.

THE forty-fifth annual meeting of the Indiana State Dental Association will be held at Indianapolis, June 30, July 1 and 2, 1903. A splendid program is being arranged by the executive committee, and a most cordial welcome will be extended to those who attend.

F. R. McCLANAHAN, *Sec'y*.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE Pennsylvania State Dental Society will hold its thirty-fifth annual meeting at Wilkesbarre, Pa., July 7, 8, and 9, 1903. An interesting and varied program has been arranged, and a large attendance is assured.

C. V. KRATZER, *Sec'y*.

NEW JERSEY STATE DENTAL SOCIETY.

THE thirty-third annual meeting of the New Jersey State Dental Society will be held in the Auditorium, Asbury Park, commencing at 10 o'clock, Wednesday, July 15, and continuing during July 16 and 17, 1903.

Four papers by eminent practitioners will be read, and, as was the case last year, the exhibits will be a greater feature than ever.

With the immense floor space at disposal everything new and novel in dentistry will be shown. Forty clinicians have promised to be present.

The Columbia Hotel, opposite the Auditorium, will be the headquarters, and the rates \$2.50 and \$3.00 per day.

Mark the date off to-day, and come on July 15th. You will be made welcome.

CHAS. A. MEEKER, *Sec'y*, Newark, N. J.

VIRGINIA STATE DENTAL ASSOCIATION.

THE Virginia State Dental Association will meet at Hot Springs, Va., on July 21-23, 1903—one day earlier than previously announced, so as to accommodate those desirous of attending the National Dental Association meeting one week later.

F. W. STIFF, *Ch'man Ex. Com.*

WISCONSIN STATE DENTAL SOCIETY.

THE thirty-third annual meeting of the Wisconsin State Dental Society will be held at West Superior, Wis., July 21, 22, and 23, 1903. The usual railroad rates will be obtained. The profession is cordially invited to be present.

T. M. WELCH, *Pres.*, Waupun, Wis.
W. H. MUELLER, *Sec'y*, Madison, Wis.

MAINE DENTAL SOCIETY.

THE thirty-eighth annual meeting of the Maine Dental Society will be held at Kineo, Moosehead Lake, July 21, 22, and 23, 1903.

This is an ideal opportunity to visit this beautiful spot, the most attractive summer resort in the state.

All dentists are cordially invited to meet with us, and we especially extend an invitation to those who are natives of Maine to participate in a pleasant and profitable reunion. We are to have papers and clinics by men of national reputation, including Dr. L. P. Haskell of Chicago, Dr. W. A. Capon of Philadelphia, and Dr. R. Ottolengui of New York.

The Mount Kineo House accommodates five hundred guests and grants us half rates on this occasion.

Reduced railroad rates from Portland.

C. H. HAINES, *Ch'man Ex. Com.*,
Dexter, Me.

SOUTH CAROLINA STATE DENTAL ASSOCIATION.

THE twenty-third annual meeting of the South Carolina State Dental Association will be held at White Stone Lithia Springs, Tuesday, July 21, 1903.

A special feature of this meeting will be the clinics, of which the following is a partial list: "Blackboard Clinic on Pyorrhea Alveolaris," J. A. Chapple; "Table Clinic on Crown and Bridge Work," Percy T. Dashwood; "Porcelain Work Demonstrated," Dr. Turner; "Jenkins' Enamel Process Demonstrated," J. D. Lochbead (manager Klewe & Co.); "Insertion of Bridge Work," C. B. Colson; "The Improved Matrix Crown," I. H. Alexander; "Cases in Bridge Work," A. L. Ott; "The Griswold System of Removable Bridges," J. Edwin Boozer; "Cases in Orthodontia," J. T. Calvert; "Rubber Plates with Telescope Crowns," B. F. Bruce; "The Wedglock Crown," A. T. Peete.

G. F. HAIR, *Cor. Sec'y*, Bamberg, S. C.

TENNESSEE DENTAL ASSO- CIATION.

THE next meeting of the Tennessee Dental Association will be held at Lookout Mountain, Chattanooga, Tenn., July 23d, 24th, and 25th.

The outlook is bright for the best meeting in the history of the association. Contributions have been promised from many eminent in the profession, both from Tennessee and other states.

A one and one-third rate of fare on the

certificate plan has been secured. Those wishing to attend the meeting of the National Dental Association at Asheville, N. C., can deposit return tickets with the agent at Chattanooga, and take up the same on their return trip.

All members are urged to be present and a cordial invitation is extended to all ethical dentists to attend and take part in the proceedings.

A. SIDNEY PAGE, *Sec'y*.

ILLINOIS STATE DENTAL SOCIETY.

AT the thirty-ninth annual meeting of the Illinois State Dental Society, held in Bloomington, May 12-14, 1903, the following officers were elected: F. H. McIntosh, Bloomington, president; C. C. Corbett, Edwardsville, vice-president; Hart J. Goslee, Chicago, secretary; C. N. Johnson, Chicago. Executive Committee—F. B. Noyes, Chicago. Supervisor of Clinics—C. E. Bentley, Chicago. Committee on Science and Literature—G. V. Black, Chicago. Committee on Art and Invention—J. H. Prothero, Chicago. Librarian—J. T. Cummins, Metropolis City. Members of Executive Council (three years)—A. H. Peck, G. W. Dittmar, Chicago, and W. A. Johnston, Peoria.

The fortieth annual meeting will be held in Peoria the second Tuesday in May, 1904.

HART J. GOSLEE, *Sec'y*.

TEXAS STATE DENTAL ASSO- CIATION.

THE Texas State Dental Association held its twenty-third annual session at Houston, Texas, May 14 to 16, 1903.

The meeting was largely attended and was a very profitable one. The following visitors were present: J. P. Gray, Nashville; Wm. Crenshaw, Atlanta; C. D. Lukens, Robert LeCron, and W. M. Bartlett, St. Louis.

The following officers were elected: Thos. P. Williams, Houston, president; Sam G. Duff, Greenville, first vice-president; W. R. Rathbone, Cuero, second vice-president; Bush Jones, Dallas, secretary and treasurer; A. F. Sonntag, Waco, curator. Executive Committee—A. J. Beville, Waco, chairman; C. O.

Webb, Crockett; and Chas. H. Edge, Houston.

The meeting for 1904 will be in Corsicana, Texas.

BUSH JONES, *Sec'y*, Dallas, Texas.

MISSOURI STATE DENTAL ASSOCIATION.

At the thirty-ninth annual meeting of the Missouri State Dental Association, held at Kansas City, May 19-21, 1903, the following officers were elected: J. H. Kennerly, St. Louis, president; F. W. Franklin, Kansas City, first vice-president; F. H. Achelpohl, St. Charles, second vice-president; H. H. Sullivan, Kansas City, recording secretary; S. T. Bassett, St. Louis, corresponding secretary; J. F. Fry, Moberly, treasurer. Board of Censors—J. C. Pasqueth, Mexico; A. L. Bridgeford, Macon; De Courcey Lindsley, St. Louis. Committee on Ethics—J. B. McBride, Springfield; J. A. Prosser, St. Louis. Committee on Publication—W. G. Goodrich, Chillicothe; Otto J. Fruth, St. Louis. Committee on New Appliances—J. F. Austin, St. Louis.

The next meeting will be held in St. Louis, on the third Tuesday in May 1904.

SAM. T. BASSETT, *Cor. Sec'y*.

NEW JERSEY BOARD OF REGISTRATION.

THE New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination on Tuesday, Wednesday, and Thursday, July 7, 8, and 9, 1903, in the assembly room of the State-house at Trenton, N. J.

Session begins promptly at 9 A.M.

All applications must be in the hands of the secretary ten days prior to the examination.

J. ALLEN OSMUN, *Sec'y*.

VERMONT BOARD OF DENTAL EXAMINERS.

THE Vermont Board of Dental Examiners hereby give notice that they will meet at the

Pavilion Hotel, Montpelier, Vt., on Tuesday, July 14, 1903, at 2 P.M., for the examination of candidates to practice dentistry.

Applications, with the fee (ten dollars), must be filed on or before July 5, 1903.

Application blanks, together with rules and instructions to candidates, can be had by applying to

GEO. F. CHENEY, *Sec'y*, St. Johnsbury, Vt.

SOUTH CAROLINA BOARD OF DENTAL EXAMINERS.

THE South Carolina State Board of Dental Examiners will hold its regular annual meeting for examinations July 20, 21, and 22, 1903, at White Stone Lithia Springs, S. C. It is necessary for applicants to come prepared to stand examinations—theoretical and practical. Diplomas should be presented with application.

BROOKS RUTLEDGE, *Sec'y*, Florence, S. C.

WISCONSIN BOARD OF DENTAL EXAMINERS.

THE next meeting of the Wisconsin State Board of Dental Examiners will be held in Superior, Wisconsin, July 20, 1903, at 9 A.M. All applications for examination should be in by July 15th. A candidate must be a graduate from a recognized college, or a regular practitioner of dentistry for four years, or an apprentice to a reputable dentist for five years. Besides the regular written examination the candidate will be required to insert a contour gold filling, furnishing all instruments and materials.

J. J. WRIGHT, *Sec'y*.

TENNESSEE BOARD OF DENTAL EXAMINERS.

THE Tennessee State Board of Dental Examiners will meet at Lookout Mountain, Chattanooga, Tenn., July 23, 24, and 25, 1903, for the examination of candidates for licenses to practice dentistry.

DENTAL COLLEGE COMMENCEMENTS.

UNIVERSITY OF PENNSYLVANIA, DEPARTMENT OF DENTISTRY.

THE one hundred and forty-seventh annual commencement exercises of the University of Pennsylvania were held in the Academy of Music, Philadelphia, on the morning of Wednesday, June 17, 1903.

The commencement oration was delivered by Horace Howard Furness, LL.D.

The degree of D.D.S was conferred by Chas. C. Harrison, LL.D., provost of the university, upon the following graduates:

Morris Rothermel Adam.	Ralph Ekin Gill.	Oren Sheldon Nims.
Stephen Alonzo Aldrich.	John Inglis Habben.	Peter Francis O'Malley.
Joseph Richard Anderson.	Robert Barry Hagerman.	Ernest Clinton Payne.
William Ralph Anderson.	Strothard Stanley Harvie.	James Frank Pearce.
Jose Miguel Arzube C.	Friedrich Alexander Hecker.	Charles Vincent Pepper.
Percy Arthur Ash.	Joseph Albert Herrman.	Alexander Francis Petzel.
Lisle Hiram Babcock.	Nathan William Hodgkins.	Norman Colquitt Poer.
Angus Robert Bain.	Nathan Ray Houck.	William Cutler Poulson.
John Tobias Bair.	Otto Ferdinand Emil Hoya.	Albert DuRose Reid.
Walter A. Barone.	Herman Peleus Hurlong.	Elmer Stauffer Ritter.
Michael Thomas Barrett.	Lucius Warren Johnson.	Homer Sexton Rowley.
Clarence Warren Beard.	Elon Kanaga.	Thomas John Ryan.
Charles Alfred Benoit.	Albert Rutherford Kennedy.	Emerson Randolph Sausser.
William Clair Boone.	Frederick Howard Kew.	Bert Seeley.
William Wheeler Brash.	Allyn Miller King.	Charles Seidel.
John Daniel Bredenberg.	Samuel May Kraeer.	Myron Bennet Shuman.
Milton M. Brooke.	Wm. Henry Harrison Larrabee.	Alfred Clemit Sloan.
Fred. B. Burdge.	Mark Alonzo Leach.	Robert Clifford Smith.
Charles Frank Callaghan.	Martin James Lillis.	Charles William Somerset.
William Hallidae Carney.	Harry Lehr Logan.	Leslie Edwin Squier.
Ernest Linwood Carr.	Leon Caspar Long.	Edward Russell Suffern.
Burton Allen Courtright.	Warner Chalmers Lotz.	Charles Rennie Sullivan.
Clarence Garfield Cross.	Joseph Casimir Ludes.	William Francis Sullivan.
Fuller Levi Davenport.	John Edwin McBride.	Joseph Edwin Turner.
Lucullus Naudain Davis.	Henry Edward McGuire.	Colin Ira Van Dyke.
Townsend Pennock Dilworth.	Thomas Arthur Major.	Hubert Clarence Visick.
Louis Albert Downing.	Cecil Holland Marks.	Loren Burton Waddell.
Edward Charles Drake.	Gamaliel Bartle Mason.	George Stees Weiler.
Joseph Potts Echternach.	John Cooper Meyers.	Chester Allen White.
Ernest Earl Elliott.	Henry Mocenter.	Harold James Fair White.
Ernest Noble Farnham.	William Allder Morrison.	Nathan Wheeler Williams.
Louis Joseph Fitzpatrick.	John Joseph Myers.	Jas. Alex. Campbell Wilson.
Henri Frossard.	Carl August Nelson.	Dale James Woods.
Milton Urich Gerhard.	Chas. Leonard Ed. Newland.	Kenzie N. Yoder.

LINCOLN DENTAL COLLEGE.

THE third annual commencement exercises of Lincoln Dental College of Cotner University, Lincoln, Neb., were held on Thursday, April 16, 1903. The doctorate address was delivered by Dr. Henry B. Ward.

Chancellor W. P. Aylsworth conferred the degree of D.D.S. on the following graduates:

Wilbur Earhart Andreson.	John Russell Davis.	Harvey James McBeth.
Frederick Martin Blair.	Herbert George Harris.	Claude Guy Stubbs.
Neil Hart Brigham.	Frederick Barret Hensel.	Robert James Walker.

CHICAGO COLLEGE OF DENTAL SURGERY.

THE twenty-first annual commencement exercises of the Chicago College of Dental Surgery were held in the Grand Opera House, Chicago, on Tuesday, April 28, 1903.

Addresses were delivered by Richard D. Harlem, A.M., and W. L. Copeland, M.D., C.M., M.R.C.S.

C. N. Johnson, M.A., L.D.S., D.D.S., conferred the degree of D.D.S. on the following graduates:

Edward Hart Allen.	Charles Balmer Fraser.	Virgil Bingham Newell.
Andrew Bertram Anderson.	Gustav Emile Fritz.	Walter Bartlett Noe.
Bernard Aronson.	LeRoy George.	William Ocasek.
Harry Armstrong.	James William Gibson.	Charles Jerome O'Dwyer.
Clarence Jacob Ash.	Forrest Eugene Gillespie.	James Charles O'Herrin.
Francis Victor Babcock.	Charles Monta Gore.	Luther Thomas Outten.
Daniel Judson Bagshaw.	Samuel Boxall Graham.	Charles Stuart Patterson.
Ralph Kissinger Baker.	Pardee Walter Greene.	Harry Clayton Patterson.
Ralph Maywood Barnes.	Arthur Gross.	Leon J. Patterson.
Robert Bell.	Henry Guenzig.	Henry Christian Peisch.
Henry Judson Bennett.	Charles Leslie Hale.	Walter Shelly Phelps.
Knute Berg.	Sherrell Woodworth Hall.	Loren Maclay Pomeroy.
Oscar Merton Bisant.	Thomas Marion Hall.	Charles Franklin Port.
George Washington Booren.	Will Woodruff Hanson.	Charles Kelley Porter.
William Tecumseh Boyer.	Marcus Aurelius Harlan.	Jerry Arnold Prescott.
Edward Glessing Brown.	George Peck Harvey.	Franklynn James Roy Price.
Robert Herman Buck.	Charles Andrew Hay.	Philip Bradley Proudfoot.
James Edward Buckley, Ph.G.	Lyle Richard Head.	Frederic Page Randall.
Daniel Shaw Buisson.	William Epley Heller.	Robert C. Rath.
Lyman Leland Burroughs.	Henry John Henze.	Daniel Brigham Read.
Harry Esmond Byars.	Paul Lorenzo Hoadley.	J. H. Reading.
Frank H. Carrels.	Alfred Henry Hoermann.	John Augustine Regan.
Bertram Frank Cihlar.	Claude Dewain Houston.	John Lewis Reuter.
George Alfred Clarke.	George Richard Horley.	Aaron Kilbourn Reynolds.
Charles James Clark.	Joseph Algernon Hutchison.	Claude Edgar Richards.
William Henry Clark.	George Edgar Johnston.	Henry Sidney Rosenholtz.
Willoughby Ray Cloud.	Edward S. Jones.	Garrett Peter Robertson.
Claude Milne Cole.	George Paul Keefe.	Otto Scheiner.
Daniel Austin Collison.	David Ervin Kelly.	Arthur Jacob Schindler.
Elbert Ellsworth Cone.	Elmer Gilbert Kesling.	John Michael Schram.
Myron Simpson Cook.	Harvey Burner Kibler.	Anton John Schurer.
Charles Clinton Cooley.	Arthur Leroy Knapp.	Frederick Joseph Sharman.
F. R. Connor.	Herman Cassimer LaCharite.	Philip Herbert Simpson.
William Francis Corbett.	Loren Oscar Landon.	George Lindsay Smith.
Charles King Corsaut.	George Phenecie Light.	Isaac Samuel Smith.
Emmett DeForrest Cretors.	Leslie Lynn Little.	William Alanson Smith.
Charles Edward Crombie.	William Frederick Lord.	Charles William Somerville.
Clark Manley Cryor.	Walter Edward Lowrie.	Orley Roy Speirs.
Ernest Garfield Dannatt.	Gustavus Munson Lovering.	Allen Calvin Stafford.
Seeley Adelbert Darling.	Thomas Aloysius Lynch.	Max Leland Stern.
Albert Dolson Davis.	Adolph Mach.	Charles Sugden.
John Charles Davis, Ph.G.	Garabed Kinos Magarian.	Earl Clifford Taylor.
Hugh Delahoyde.	Albert Charles Manz.	Russell Ray Tobey.
John Arthur DeMamprey.	Joseph Mietus.	Enoch Van Cott.
Robert Hezzie Dishman.	Frank L. Miller.	Herman Van Hasselt.
Frederick Augustus Eastman.	Oscar Allen Mitchell.	Richard Thomas Ward.
Oscar Walter Eaton.	Leon Marlin Muedeking.	William Lorin Warren.
Robert Odemar Eberhart.	Harry H. Murphy.	Wm. Charles Crossley Wells.
Adams Wesley Ensign.	Fred Edgecomb Murry.	James Oscar Werntz.
Louis Weber Evans.	Harold Alfred Muzzall.	Joseph Wallace West.
David Melvin Fee.	Lachlan Cameron MacMurray.	Frank Edwin White.
James Carlton Ferrell.	Austin Charles McGuire.	George William Wilcox.
Ralph Irwin Findley, B.L.	John Sterling McLaren.	Odin Neil Williams.
Charles Royal Flatt.	Sven Narbo.	Robert Arthur Williams.
Harry Vincent Flynn.	Samuel Robert Neidigh.	Clarence Garfield Winchell.
Robert Ignatius Flynn.	Charles Henry Nelson.	Roy Ernest Wyman.
William Francis Foster.	Marcus Arnolphus Neumeyer.	

UNIVERSITY OF SOUTHERN CALIFORNIA DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of the University of Southern California were held in Simpson Auditorium, Los Angeles, Cal., on Tuesday, May 19, 1903.

Addresses were delivered by Geo. F. Bovard, A.M., D.D., Geo. Thos. Dowling, D.D., and Garrett Newkirk, M.D., dean.

The degree of D.D.S. was conferred on the following graduates:

William Albert Baker.	Harry Walter Hack.	Charles Davis Stambaugh.
William John Brizius.	William Raymond Honodel.	George Lyman Stookey.
Bert Boyd.	John Morrison Keagy.	William Hamilton Lee Symington.
Kate Diantha Buck.	John Parkhill Luccock.	Walter John Wallace.
Forney Edwin Burt.	Seitaro Saitow.	Genette Francis Weaverling.
Paul Bernard Caler.		

OMAHA DENTAL COLLEGE.

THE eighth annual commencement exercises of the Omaha Dental College were held in Boyd's Opera House, Omaha, Neb., April 30, 1903.

The address to the graduates was delivered by Hon. James H. Macomber.

Rev. David R. Kerr conferred the degree of D.D.S. on the following graduates:

William Victor Beck.....	Nebraska.	Orville Rush Ivins.....	Nebraska.
Roy Porter Belden.....	Nebraska.	Frank Isaac Letson.....	South Dakota.
Harley Orin Bliss.....	Nebraska.	Ned Shockley	Iowa.
Edward Henry Bruening.....	Nebraska.	Bertrand Franklin Spicer.....	Iowa.
Charles Adelbert Calkins.....	Nebraska.	Monto Smith	Nebraska.
James Monroe Cottrell.....	Nebraska.	Elmer Alonzo Thomas.....	Nebraska.
Olin Hartman Cressler.....	Nebraska.	Timothy Jefferson Todd.....	Nebraska.
John Edward Douglas.....	Nebraska.	Frank Willard Warner.....	Nebraska.
Dwight Wm. Williman Dulaigh..	Nebraska.	Leonard Harley Warner.....	Nebraska.
Joseph Marion Foster.....	Iowa.	Charles Clarence Whisler.....	Nebraska.
George Lemon Gallagher.....	Nebraska.	George Raymond Woods.....	Nebraska.

ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

THE annual commencement exercises of the Royal College of Dental Surgeons of Ontario were held in the Y. W. C. Guild hall, McGill st., Toronto, Ont., on Thursday, April 30, 1903.

The degree of L.D.S. was conferred on the following graduates:

Ernest Franklin Arnold.	Alva E. Heacock.	George Albert Munroe.
Fred. Nichol Badgley.	Frank Garfield Hendry.	Edward Charles Pickard.
Ernest Symons Baker.	Herbert Irvine.	Achille Andre Pinard.
W. H. Walton Ball.	James Bremner Johnstone.	Harris Popplewell.
Geo. Wm. Bald.	Charles Henry Juvet.	Walter Garnet Price.
J. A. Bradley.	William Kennedy.	Henry O. Richardson.
Matthew Poole Corrigan.	Jas. W. Kinnear.	H. E. Wesley Richardson.
Geo. Henry Coram.	Fred. Temple Knight.	Arthur Peter Rutherford.
H. W. DeRenzy.	Geo. Edwin Long.	Herbert M. Sanderson.
Rollin O. Dickson.	M. McCloskey McGahey.	James Arthur Slade.
Walton V. Dixon.	Geo. Edward McGuire.	Albert Victor Summers.
Leo Doran.	Alex. McKenty.	Charles Berkley Taylor.
Robert Lorne Dudley.	H. Patrick McKenna.	T. Geo. Thompson.
George Wesley Everett.	William John McMurray.	Charles Finlay Walt.
Howard Fowler.	John Paris MacLachlan.	Fred Lyell Williamson.
George Alexander Fraser.	William H. Milsap.	John Ralph Will.
Matthew Henry Garvin.	William D. N. Moore.	Wm. Graham Wood.
Oscar Garnet Hassard.	George Ferdinand Moore.	Thomas H. Wylie.

MARION-SIMS DENTAL COLLEGE.

THE annual commencement exercises of the Marion-Sims Dental College were held at the Odeon, St. Louis, Mo., Saturday evening, April 25, 1903. Addresses were delivered by Hon. Thos. H. Carter, ex-senator of Montana, and Mr. Howard J. Rogers, member of the World's Fair Educational Commission.

The dean, Dr. M. C. Marshall, conferred the degree of D.D.S. upon the following graduates:

Marion Apple.....	Illinois.	Philip Bruce Linville, Jr....	Missouri.
John Dwight Coburn Askins.....	Illinois.	Harvey Allen Loundagin....	Washington.
William McNutt Collins.....	Missouri.	George Upchurch Mason....	South Carolina.
Harry Joseph Crone.....	Missouri.	Virgil Edwin Martin.....	Missouri.
Gideon Mark Dempsey.....	Illinois.	Charles Francis McKay....	Missouri.
Carey Ernest Duff.....	Illinois.	Carl Milner McMahon....	Missouri.
Isham Davis Elder.....	Texas.	James Davenport Morris...	Massachusetts.
William Pinkney Elliott.....	Arkansas.	Robert Harold Offill.....	Illinois.
William Scott Farris.....	Missouri.	Thomas Green Plummer....	Missouri.
William Frederick Gerhardt....	Missouri.	John Franklin Ralston....	North Dakota.
James Patrick Geekie.....	Missouri.	Virgil Overton Suggett....	Illinois.
Bernard Steven Hanley.....	Missouri.	Lloyd Elmer Summers....	Minnesota.
Thomas Goodale Hawley.....	Missouri.	William Dixie Tiller.....	Missouri.
Robert Lehmann Hesser.....	Missouri.	Leslie Rush Wilson.....	Missouri.
Charles Stephens Holschbach....	Missouri.	William Andrew Wainright.	Illinois.
Harry Keehn	Missouri.	Thomas Henry Walton....	Missouri.
George Lee Kitchen.....	Missouri.	Bruce Wallace Willis.....	Missouri.
John Armstrong Ladd.....	Missouri.	William Dick Van Winkle..	Missouri.
Cyrus Floyd Lawler.....	Missouri.	Redmon Herschell Woods..	Missouri.
Elmer Zerse Leibrock.....	Missouri.		

MEHARRY MEDICAL COLLEGE, DENTAL DEPARTMENT.

THE seventeenth annual commencement exercises of the Dental Department of the Meharry Medical College were held at Union Gospel Tabernacle, Nashville, Tenn., March 2, 1903.

President J. Benson Hamilton, D.D., conferred the degree of D.D.S. on the following graduates:

D. F. McCarrion.....	South Carolina.	J. P. Jacobs.....	Alabama.
J. P. Frierson.....	Tennessee.	J. C. Johnson.....	Alabama.
Wm. D. Holder.....	Tennessee.		

CENTRAL COLLEGE OF DENTISTRY.

THE annual commencement exercises of the Central College of Dentistry were held at College Hall, Indianapolis, Ind., May 1, 1903.

An address was delivered by Samuel E. Earp, M.S., M.D.

Homer A. Sampsell, D.D.S., conferred the degree of D.D.S. on the following graduates:

Walter E. Beyer.	Walter J. Carroll.	Roy C. Kilmer.	Carl O. O'Rear.
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NORTHWESTERN UNIVERSITY DENTAL SCHOOL.

THE commencement exercises of the Northwestern University Dental School, Chicago, were held Thursday, April 30, 1903.

The doctorate address was delivered by Edmund Janes James, A.M., Ph.D., LL.D., president of the University, and the valedictory address by Aaron Miles Olson.

The degree of D.D.S. was conferred by Edmund Janes James on the following graduates:

Charles Barton Ackert.	David Hart Gottlieb.	William Laurence Mullin.
Earl Stanley Addison.	Harold Wilcox Greely.	Lloyd Lawrence Murphy.
Lee Ashley Bacon, B.S.	Edwin Stanton Gregg.	John Nelson.
Wallace Nelson Bailey.	Robert Emmitt Hagerty.	Thomas Odail Nevil.
Charles Reeder Baker.	George Edward Haigh.	Sarah Catherine Norman.
John Ellsworth Baker.	Dillon Hamilton.	Dennis James Normoyle.
Joseph Simian Baldrige.	Louis Frank Harder.	Aaron Miles Olson.
Raymond Waldo Bane.	Charles Simpson Hart.	Gerald Jay Packard.
Edward Sutherland Barber.	Edward Nelson Hegge.	Ernest Shear Packson.
Dudley Dean Bayless.	Matthew Heller, Jr.	Silas Birdsall Pardee.
Gulielmus Alex. Beaumont.	Alfred Heymar.	Murry Albert Patton.
Harry Wales Belknap.	John Carlton Hilbert.	Herman Henry Paulsen.
George Nathaniel Bergbom.	Frederic Crider Hoffer.	William August Peters.
Earl James Blackmore.	Charles Hopper.	Arthur Clark Peterson.
Edward Ward Blaisdell.	Charles Robert Huber.	Jesse W. Phillips.
William Earl Blake.	Robert E. Huff.	Warren Byron Phillips.
Louis Lamonte Bliss.	Herbert Schulter Hughes.	Loren George Pierce.
Mark David Bogart.	Floyd Milton Hutchinson.	John Reilly.
Edward P. Bridgman, Jr.	Leo Simplicius Hutchinson.	John Jay Richter.
William Wyart Brooks.	Francis Byron Ingersoll.	Rufus John Roberts.
Charles Fredrick Brown.	George Raymond Jackson.	Arthur Hayes Robertson.
Roy Lawrence Brown.	Charles Alonzo Janes.	Louis Frederic Robichaux.
Albert Henry Brunner.	Elbert Clyde Jenkins.	Herbert Ross.
Glenn Canary Burbank.	Harry Earnest Jordan.	George Bruce Rothlisberger.
Ira Ailesworth Burnett.	Vane Alton Jordan.	William James Salisbury.
Alvah Wert Calvert.	Maximillian Stienke Kern.	Frank Ebert Sanberg.
Helfrid Ouchterlony Carlene.	Warren J. Kesler.	Andrew William Sauer.
John Francis Carroll.	John Finley Kettles.	Oscar Charles Schmidt.
Harrison Baskett Cave.	Major Ransom Kinner.	Otto Henry Schultz.
Herbert Franklin Christie.	LeRoy Allen Knapp.	Charles Herbert Seymour.
Truman Tracy Church.	Samuel S. Kruchevsky.	Guy James Shiels.
John J. Clemmer.	Herman James Laffitte.	Henrik S. Shipstead.
Caryll Eugene Cline.	Johannes Adolf A. Land.	Austin Ora Smith.
Wallace Bruce Colbert.	Ivy Garfield Lawrence.	Charles Edward Smith.
James Furman Conover.	George Henry Linaker.	Perry Lee Smith.
Andrew John Courtice.	Adam Lind.	Louis Edward Spiers.
William Adam Cox.	John J. Link.	Charles F. Steinbaur.
William Pollock Craig.	John Battiste Looze.	John Murray Stephens.
Edwin A. Crane.	Robert C. McAvoy.	Moses Ellsworth Stewart.
Reuben Brooks Crose.	Oliver Carrol McCollom.	Charles Augustus Sweeney.
George Robert Curren.	Frank James McLaughlin.	Ernest Robert Teasdale.
William Curtiss Dalbey.	Joseph Scott McNinch.	William John Thayer.
Albert Joseph Dauterive.	Cecil James H. Magee.	Alvin Allen Theile.
Paul Burritt DeGroff.	David Graham Marks.	Charles Henry Thompson.
Herbert Chester Dewey.	James Clyde Mathies.	Robert Benjamin Thurman.
Morton Stanley Dodge.	Otto Fredrick Mau.	Andrew Nicholas Trompen.
Wilbert Jacob Dodge.	Roscoe Conklin Maxwell.	James Clark Waddell.
Arthur F. Douglass.	Martin Thompsen Melde.	John Benjamin Wagoner.
William Thomas Easton.	Irving Anchony J. Milbyer.	John Jay Welker.
William Murray Edgar.	James Madison Miller.	Isabelle B. Welsh.
Richard Adolf O. Ehrenhauss.	Julius John Miller.	Stanley Carpenter Welsh.
Henry Delbert Elmerston.	Robert Tatham Miller.	Alvah Leroy Wenner.
George Morton Fairfield.	Dwight Edwin Moore.	Will Walter Wick.
Ambrose Terry Fisher.	Cyril Morris.	Henry Emil Wolkow.
Elvira Forrest.	Perry James Morton.	Albert Henry Woolson, Jr.
Orel S. Fowler.	George Martin Mullen.	Edwin Glenway Yeamans.
George Thomas Fox.	William Henry Mullen.	Frank James Yerke.
Forrest Lee Gardner.	Joseph Henry Mullin.	Gerhart Henry Young.
Joseph Archible Gardner.		

NEW YORK COLLEGE OF DENTISTRY.

THE thirty-seventh annual commencement exercises of the New York College of Dentistry were held in Carnegie Hall, New York city, May 18, 1903.

The valedictory address was delivered by Lorenzo Foster Luckie, D.D.S., and the address to the graduates by Lindsey Parker, D.D.

The degree of D.D.S. was conferred by Rev. George Alexander on the following graduates:

Louis Leonard Beck, B.S.....	New York.	Max Jacob Ortman.....	New York.
Melville Jerome Beckel.....	New York.	Isaac Oshlag	Russia.
Sidney Howard Bier.....	Pennsylvania.	Joseph Mota Ranché, B.Ph.....	San Domingo.
Harry Bloom.....	New York.	Gottlieb Chris Rathfelder.....	Germany.
Edwin Stanton Brown.....	New York.	Cortlandt Field Raymond.....	New York.
Alfred Washington Costales...	New York.	Edward H. Raymond, Jr., A.B.	New York.
Le Roy Sherman Edwards.....	New York.	Rudolph Henry Reese.....	New York.
Charles Faupel	New Jersey.	Jacob Oscar Saphro.....	New York.
Oscar Hermann Folkers, M.D..	California.	Oscar Schminke	New York.
William Francis Garner, Jr...	New York.	Joseph Mortimer Schwartz....	Russia.
John Y. Gottfried.....	New York.	Frederick George Schwarz....	New York.
Arthur Grimm	Nebraska.	Edward Shnayerson	New York.
Emil John Johnson.....	New York.	Julian Nicolas Sloat	Russia.
James Kadin	New York.	Augustus Collier Smith.....	New Jersey.
Horace West King.....	New York.	Charles Peck Sniffen.....	New York.
Aaron Lane	New York.	Arthur Crawford Stoney.....	New York.
Charles Lichtenwalner, A.B....	Pennsylvania.	Barney Tepper	New York.
Samuel Liebling	New York.	Charles Wesley Tillou, Jr....	New York.
Jacob Feodor Lief.....	New York.	Edward Sperry Tomlinson....	Connecticut.
Julius Lowenstein	New York.	Nathan Unger	New York.
Lorenzo Foster Luckie.....	Alabama.	Robert Wakefield.....	New Jersey.
John Elmer Earl Megaw.....	New York.	Isidor Charles Weinzeig.....	New York.
William Henry Mills, Jr.....	New York.	Edwin Grey Whaley.....	New York.
Henry Milsner	New York.	Jacob White	New York.
Waldo Hutchings Mork.....	New York.	Henry Morton Zeitlen.....	New York.
Clarence Martense Norcom....	New York.	Charles Simon Wolff.....	New York.
Victor Olsa	Hungary.	Julius Zuckerman	New York.

HOWARD UNIVERSITY, DENTAL DEPARTMENT.

THE commencement exercises of Howard University, Dental Department, were held at the First Congregational Church, Washington, D. C., May 5, 1903.

The charge to the class was delivered by Prof. J. M. Lamb, M.D., D.D.S.

Teunis S. Hamlin, D.D., conferred the degree of D.D.S. on the following graduates:

George Herbert Butcher.	District Columbia.	William H. Nightingale..	British West Indies.
William Crosbie.....	British West Indies.	Robert Lee Peyton.....	District Columbia.
Ambrose E. Gaskin.....	District Columbia.	Aaron Russell, Jr.....	Pennsylvania.
William Thomas Lovette.	Virginia.	Thomas A. Stevens.....	Virginia.
James Monroe McInham.	Kentucky.		

BIRMINGHAM DENTAL COLLEGE.

THE tenth annual commencement exercises of the Birmingham Dental College were held at the Jefferson Theater, Birmingham, Ala., May 1, 1903.

The degree of D.D.S. was conferred on the following graduates:

John C. Fason.....	Alabama.	Robert C. Morefield.....	Alabama.
D. D. Griffin.....	Mississippi.	Alonzo E. Powers.....	Alabama.

ATLANTA DENTAL COLLEGE.

THE annual commencement exercises of the Atlanta Dental College were held in the Grand Opera House, Atlanta, Georgia, April 30, 1903.

The valedictory address was delivered by DeLos Lemuel Hill.

Judge W. R. Hammond, president of the board of trustees, conferred the degree of D.D.S. on the following graduates:

J. Lewis Askew.....	Georgia.	Chaudoin Manry	Georgia.
William Seaborn Brown....	Georgia.	Alexander Pope McClendon..	Alabama.
John Ed Chapman.....	Georgia.	Charles Dutart McDowell...	Texas.
Enoch S. Cooper.....	Alabama.	Nat G. Oattis.....	Georgia.
Robert R. Cason.....	Georgia.	Samuel C. Patton.....	Texas.
J. G. Campbell.....	South Carolina.	James Wilbur Passmore....	Alabama.
Render B. Callahan.....	Georgia.	G. Adolphus Rush.....	Mississippi.
J. Harry Connor.....	Georgia.	William F. Roper.....	Canada.
Neill Alexander Culbreth...	North Carolina.	Russell H. Rogers.....	Georgia.
Truss Floyd	North Carolina.	W. R. Robbins.....	Georgia.
Philip M. Gayle.....	Louisiana.	John M. Smith.....	Mississippi.
D. Naylor Garner.....	Mississippi.	Victor E. Strahan.....	Mississippi.
G. J. Griffiths.....	Georgia.	Perry Haskell Shealy.....	South Carolina.
Lauriston Irvin Gidney.....	North Carolina.	Milton Lamb Sifly.....	South Carolina.
Jean Bothwell Garrett.....	Georgia.	Eugene Philip Stutts.....	Alabama.
DeLos Lemuel Hill.....	Georgia.	W. V. Thomson.....	Mississippi.
H. R. Jewett, Jr.....	Georgia.	Walter Maxwell Taylor....	Georgia.
John Thomas Lightner.....	Georgia.	James H. Taylor.....	Georgia.
Carl H. Lennon.....	North Carolina.	John Lee Varnell.....	Tennessee.
T. A. Lifsey.....	Georgia.	Francis Powell Walker....	Mississippi.
J. A. Mayo.....	Georgia.	James Albert White.....	North Carolina.
Joseph Way Moody.....	Georgia.	Walter Albert White.....	North Carolina.
R. Holmes Mason.....	Georgia.		

INDIANA DENTAL COLLEGE.

THE twenty-fourth annual commencement exercises of the Indiana Dental College (University of Indianapolis, Department of Dental Surgery) were held at Indianapolis, Ind., May 2, 1903.

An address was delivered by A. E. Bulson, A.B., M.D.

John N. Hurty, M.D., Phar.D., conferred the degree of D.D.S. on the following graduates:

E. E. Blickenstaff.	Walter H. Henkel.	Glenn Rafferty.
Roy Bodine.	J. B. Hinchman.	Chas. Raymond.
Geo. F. Brand.	F. A. Holmes.	F. W. Reinders.
A. A. Bridge.	M. M. House.	W. L. Row.
H. O. Burgett.	J. D. Hughes.	Wm. Russell.
C. G. Cameron.	E. S. Hulley.	W. O. Sears.
A. P. Campbell.	C. A. Isham.	R. T. Siegmund.
G. A. Cash.	F. A. Krapohl.	A. A. Spears.
Oscar Collins.	F. L. Kreep.	F. E. Stephens.
A. T. Corson.	Wylie Lamb.	F. E. Stevenson.
Thos. Costello.	Delbert Lewis.	J. L. Strain.
A. J. Davis.	O. H. Lowder.	C. B. Tattershall.
W. A. Dicken.	E. K. Mabry.	J. W. Toye.
G. W. Early.	J. T. McCann.	R. S. Walker.
Chas. Feldman.	R. H. McKinney.	G. S. Wampler.
Louis Friedman.	F. M. Miller.	Roy A. Weaver.
E. L. Friel.	M. J. Moran.	W. A. Wheeler.
E. W. Gant.	W. A. Morgan.	C. E. White.
Geo. E. Harter.	M. E. Myers.	J. C. Whitney.
K. E. Hatch.	J. E. Nelson.	E. D. Wilkison.
Perry Heath.	W. D. Place.	J. E. Wilson.

PITTSBURG DENTAL COLLEGE.

THE seventh annual commencement exercises of the Pittsburg Dental College, Department of Western University of Pennsylvania, were held in Carnegie Music Hall, May 1, 1903.

The address to the graduates was delivered by Prof. J. H. Beal, Sc.D., Ph.G.

The degree of D.D.S. was conferred upon the following:

Alfred Core Abraham.	Aylett Raines Frampton.	James Bratton Parks.
Marion Allen Artman.	William Edward Getty.	Worth Paugh.
Abram Christie Barclay.	Webster Bruce Glotfelty.	Charles Edward Petrie.
Alexander Eugene Bard.	Richard Joseph Graham.	Eli Cope Phillips.
John Flocker Biddle.	Frank Leslie Hampson.	Henry Wilferd Reader.
Ross Boyd Blair.	Howard Monroe Hendry.	John Benjamin Robison.
Charles Greenawalt Brice.	William Stanley Holland.	Pearl Evans Rowe.
Edgar Warren Campbell.	William Jackson.	James Polk Scott.
Eugene Alphonso Clark.	Oliver Van Gunton Kaiser.	Howard Russell Smith.
Walter Scott Clark.	Arthur Raymond Kramer.	Sarah Clara Edith Stauffer.
Harry Clifford Coleman.	Job Ruben Martin.	Robert Jay Stewart.
Clark Leander Creery.	Benjamin Franklin Middaugh.	William Robinson Stewart.
Howard Earl Cromwell.	Joseph Randolph Naylor Miller.	Clyde St. Clair Vogel.
Warren John Curry.	Robert Adams Minton.	Richard Aloys Walsh.
Claude Melvin Davis.	George Frederick Mohr.	Herbert Ambrose Wehrle.
Clark Johnson Dickie.	John Milton McClymonds.	Mrs. Katharine Cecelia Welsh.
Wallace Hays Dunn.	William Augustus McCready.	George Thompson Williams.
John Jeffreys Evans.	Raymond McCullough.	Robert Zugsmith.
Claude Andrew Frank.	Edward Ignatius McKeown.	

UNIVERSITY COLLEGE OF MEDICINE, DENTAL DEPARTMENT.

THE commencement exercises of the University College of Medicine, Dental Department, were held at Richmond, Va., May 14, 1903.

An address was delivered by Hon. Don P. Halsey.

The degree of D.D.S. was conferred on the following graduates:

Phares W. Calliham.....Louisiana.	Lewis Du Val Pilcher.....Virginia.
Courtney Edmond Virginia.	Walter S. Quaintance.....Virginia.
J. Segar Epes, Jr.....Virginia.	Jacob A. Richard.....Virginia.
George Hayden Virginia.	Frank B. Stephens.....Florida.
R. Edward Lee Miller.....Virginia.	Wm. Allison Stores.....Virginia.

WASHINGTON UNIVERSITY, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of Washington University (Missouri Dental College), St. Louis, Mo., were held in the Memorial Hall of the college, on Wednesday, April 29, 1903.

An address was delivered by Judge Daniel G. Taylor, and the degree of D.D.S. was conferred by Dr. J. H. Kennerly, dean, on the following graduates:

Henry Etna Allee.....Missouri.	Edward Reginald Harrison....Iowa.
Munson Platt Ambrose.....Missouri.	Edward Herman Hohman....Illinois.
Arthur Gratz Beshears.....Missouri.	Edgar Evan Moore.....Texas.
James Alexander Brown.....Missouri.	Oscar Osten.....Germany.
Ben Watson Carey.....Illinois.	William Ashworth Reynolds..West Virginia.
George Wesley Cottingham.....Missouri.	Charles William Schillinger..Missouri.
Matthew Edgar Coy.....Missouri.	Walter Moore Scott.....Missouri.
William Cosby Crenshaw.....Missouri.	John Richard Shikles.....Missouri.
Frank Billups Ferrill.....Mississippi.	Charles Aiken Summers.....Illinois.
Julius Jacob Graf.....Missouri.	Albert Dean Wilkinson.....Missouri.

COLLEGE OF DENTISTRY, UNIVERSITY OF CALIFORNIA.

THE annual commencement exercises of the College of Dentistry, University of California, were held at Berkeley, Cal., May 14, 1903.

The degree of D.D.S. was conferred on the following graduates:

Totaro Asahina.	Miss Della May Johnson.	Roy Sibley.
Ralph Roscoe Aten.	John Birchim Jones.	Adam Albert Solley.
Irving Rattan Bailey.	Fred James Kinley.	John Henry Stineman.
Richard Fred. Beamer.	Louis Raymond Lamb.	Henry Lyttleton Taylor.
Miss Jeannette H. Boardman.	Julius Peter Lassen.	Homer Irwin Talbott.
Thomas Francis Casey.	Monroe Lloyd Marx.	George Alexander Therkof.
Ernest Augustus Cockburn.	Miss Mable Eliza Marshall.	James Roberd Thomas.
George Edgar Cox.	James Alvah McBain.	Charles McRobert Tomlinson.
Edward Fitts Dunbar.	Richard Ephraim Morton.	Edgar A. Ulsteen.
Leonidas Anthony Gautier.	Charles John Nicolai.	Frederick Eben Webster.
Royal Bertram Giffen.	Jeremiah O'Brien.	Frederick Ellis Wilkins.
Francis Ignatius Gonzalez.	Lloyd Mills Place.	Carlos Williams.
Allen H. Grant.	Charles Casper Ricks.	Ernest Guy Williams.
Horace McDonald Hays.	Donald Harvey Ross.	Joseph Rankin Young.
George Andrew Hodges.		

NORTH PACIFIC DENTAL COLLEGE.

THE annual commencement exercises of the North Pacific Dental College were held at the First Baptist Church, Portland, Ore., April 29, 1903.

The annual address was delivered by Hon. John F. Caples, and the valedictory by Frank Winfield Hergert, D.M.D.

The dean, Dr. Herbert C. Miller, conferred the degree of D.D.S. on the following graduates:

Joseph Francis Alexander.	Frank Winfield Hergert.	John J. Emmet O'Connor.
Mabel Kester Atkinson.	Frederick William Hunt.	Joseph E. Shields.
Fred Arthur Blackmore.	Albert Freeman Kirshman.	Nathan Harvey Smith.
Alfred Wortley Burns.	Harry Victor Luithlen.	Nelson Harris Stewart.
William Moritz Sauter Calderwood.	Jeannie E. Jackson Lynch.	Walter Pugh Tillman.
Walter Stanley Derby.	William Duncan McMillan.	Charles Franklin Wood.
William Farquhar Fraser.	Charles Ernest Moreland.	Jack Marshal Yates.
Grant Edwin P. Freeborn.	Louis Adam Morris.	

MILWAUKEE MEDICAL COLLEGE, DEPARTMENT OF DENTAL SURGERY.

THE annual commencement exercises of the Department of Dental Surgery of the Milwaukee Medical College were held at the Alhambra Theater, Milwaukee, Wis., May 1, 1903.

The degree of D.D.S. was conferred on the following graduates:

Peter Samuel Barsness.	George Washington Haskell.	George Emanuel Mason.
Clyde Morton Bricker.	Henry Dahl Herthel.	Eberhard F. Notz.
Emory Joseph Clark.	Gustav Henry Heise.	Edward Oliver Roberts.
James Edward Dexter.	William Arja Jones.	Louis John Ritzenthaler.
Frank Aloysius Ferriter.	Arthur Alwyn Jennings.	George William Spang.
Eugene William Flohr.	Thomas Johnson.	Herman Derck Tasche.
Edwin Charles Franz.	Otto George Krause.	John Andrew Vogel.
Raymond Horace Gudger.	Edmund Herman Kreutzmann.	John Edward Wagner.
William Thornton Hardy.	Arthur Laidlaw.	William Emil Wellge.
Charles Frederick Happle.	Edwin Liebstuck.	Egbert Archie Worden.
Garlon Ellice Harrington.	Adam William Loos.	

COLLEGE OF PHYSICIANS AND SURGEONS, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of the College of Physicians and Surgeons, San Francisco, Cal., were held at the Alhambra Theater, May 21, 1903.

The degree of D.D.S. was conferred on the following graduates:

Juan B. Arellanes, Jr.	Isabelle Dunbar Harris.	Henry Alexander McNeil.
Newton Adolph Bergman.	Norman Henderson.	Thomas O'Connell.
August Joseph Cafferata.	Edwin P. James.	Ituge Okubo.
George De Los Craig.	Harrison Howard Keene.	Gideon H. Smith.
E. Kent Dartt.	Francis Cecil Kleeman.	Walter Alexander Twiggs.
Andrew Fleming Dollin.	George Edward Malone.	George Young Vandever.
Charles A. Halen.	Rufus Freeman McFarlin.	Philip J. Walton.
Douglas A. Hare.		

DETROIT COLLEGE OF MEDICINE, DEPARTMENT OF DENTAL SURGERY.

THE annual commencement exercises of the Department of Dental Surgery of Detroit College of Medicine were held at the Light Guard Armory, Detroit, on Thursday evening, June 11, 1903.

The valedictory address was delivered by Peter W. Ronan.

The degree of D.D.S. was conferred by the president, Hon. Sidney D. Miller, on the following graduates:

James F. Alexander.	Frank W. Holt.	James A. Nelson.
Lynn J. Beardslee.	Earle H. Kidd.	Leon W. Peart.
George A. Bell.	Harry Knowlson.	William Perry.
Dalbert Bennett.	Thomas T. Laird.	Peter W. Ronan.
Walter L. Black.	Charles R. Lake.	Charles A. Sackrider.
Norman W. Buege.	Ellsworth L. McCain.	George Schmitt.
Daniel W. Campbell.	John A. McPhail.	Frank H. Scott.
Allison Chisholm.	John A. Marshall.	James A. Shaw.
Lyman A. Cottingham.	Joseph L. Martin.	Sidney Smith.
William H. Elliott.	Harry A. Mason.	Fred. H. Swart.
George A. Elspass.	George M. Merrick.	Fred. J. Thompson.
Hugo E. Ewart.	Fred. R. Mitchell, M.D.	George K. Tolford.
William G. Ferguson.	Edward A. Moeller.	George R. Treanor.
Harold H. Hare.	James B. Munro.	Edwin A. Ulrich.
Hermann J. Hill.	George Myers.	Charles M. Wheeler.
William L. Holmes.		

VANDERBILT UNIVERSITY, DEPARTMENT OF DENTISTRY.

THE annual commencement exercises of the Department of Dentistry of Vanderbilt University were held at the University chapel, Nashville, Tenn., May 5, 1903.

The degree of D.D.S. was conferred on the following graduates:

Rush P. Abbott.....	Mississippi.	Michael J. Murray.....	Tennessee.
Thomas Brown	Tennessee.	Ewell Neil.....	Tennessee.
John Curtis Burnam.....	Tennessee.	Miss Lynne Percy.....	Indiana.
P. M. Fugler.....	Mississippi.	Richard L. Senter.....	Mississippi.
Sam. T. Rufus Green.....	Texas.	Marion Edward Shewmake...	Arkansas.
M. R. Hull.....	Texas.	James Richmond Stokes.....	South Carolina.
C. W. Kranz.....	Alabama.	Viston Taylor.....	Tennessee.
Monza M. Marron.....	Louisiana.	William T. Walker.....	Alabama.
William S. McKinstry.....	Tennessee.	John W. Fraser Williams....	Kentucky.

MEDICO-CHIRURGICAL COLLEGE, DENTAL DEPARTMENT.

THE annual commencement exercises of the Dental Department of the Medico-Chirurgical College were held at the Academy of Music, Philadelphia, Saturday, May 23, 1903.

The doctorate oration was delivered by Prof. Arthur E. Kennelly, Sc.D., of Harvard University.

Ludwig S. Filbert, M.D., conferred the degree of D.D.S. on the following graduates:

Robert Adams, Jr.....	Pennsylvania.	E. E. Howerter.....	Pennsylvania.
Clarence H. Crist.....	Pennsylvania.	David D. Hyman.....	Pennsylvania.
Peter E. Costello.....	Pennsylvania.	Arthur M. Knight.....	New Jersey.
Samuel J. Clark.....	New York.	George F. Lancaster.....	Connecticut.
Rheinard Z. Clemmer.....	Pennsylvania.	William J. McKinley.....	Pennsylvania.
Harold C. Davis.....	New Jersey.	Charles A. Miller.....	Pennsylvania.
Michael M. Dunphy.....	Massachusetts.	Frank W. Miller.....	Pennsylvania.
Louis Englander.....	Pennsylvania.	Oliver J. Reiss.....	Louisiana.
Barritt B. Filer.....	New Jersey.	Albert F. Seip.....	Pennsylvania.
Nathan Fox.....	South Africa.	Richard Souder.....	Pennsylvania.
Samuel B. Harris, M.D.....	Pennsylvania.	Raymond Wilson.....	Pennsylvania.
Howard A. Harvey.....	Canada.	Edwin K. Wood.....	Pennsylvania.
Odillon K. Hoppes.....	Pennsylvania.		

BALTIMORE MEDICAL COLLEGE, DENTAL DEPARTMENT.

THE eighth annual commencement exercises of the Dental Department of the Baltimore Medical College were held at the Lyceum Theater, Baltimore, Md., on Friday, May 1, 1903.

The valedictorian was Rev. James O. S. Huntington, and the degree of D.D.S. was conferred by Prof. J. D. Blake, president of the faculty, on the following graduates:

J. Ernest Keyworth.....	Maryland.	Edward A. O'Donnell.....	Massachusetts.
Rudolph Oscar Schlosser....	Connecticut.	Richard Alexander Ker.....	New York.
Edwin Richards Keast.....	New Jersey.	Frank Anderson Buckmaster.	Delaware.
Victor Hofmann.....	Germany.	Jas. Henry Stanislaus Reddy..	Massachusetts.
James P. Casey.....	Massachusetts.	William Stiff Robinson.....	Maryland.
Waldo Hayward.....	Massachusetts.	Malcolm MacDougall.....	Pennsylvania.
Shintaro Tanaka.....	Japan.	William H. Wimbrough.....	Maryland.
Charles Godwin Powell.....	North Carolina.	George Theodore Barben.....	New York.
Ernst Rudolf Czerwinski.....	Germany.	Lilburn William Febuary....	Tennessee.
Geo. T. Thompson.....	Massachusetts.	J. Preston Sencindiver.....	Maryland.
Edward Stieff.....	Maryland.	Williams Whitney	Maine.
Frederick Lewis Norton.....	Maine.		

COLUMBIAN UNIVERSITY, DENTAL DEPARTMENT.

THE eighty-second annual commencement exercises of the Dental Department of the Columbian University were held in the National Theater, Washington, D. C. June 1, 1903.

An address was delivered by Wm. Williams Keen, M.D., LL.D.

The degree of D.D.S. was conferred on the following graduates:

Ernest M. Butz.....	Pennsylvania.	Ernest R. Hagan.....	Michigan.
Caesare L. Constantini District of Columbia.		John W. Shaw.....	Iowa.
B. Avery Gardner.....	New York.	Ernest E. Smith.....	District of Columbia.
Wilmer B. Greene....	District of Columbia.		

COLLEGE OF DENTISTRY OF THE UNIVERSITY OF MINNESOTA.

THE thirty-first annual commencement exercises of the College of Dentistry of Minnesota were held in the Armory, Minneapolis, June 4, 1903.

An address was delivered by James Brooks Dill, Esq.

The degree of D.D.S. was conferred by Cyrus Northrop, LL.D., president of the university, on the following graduates:

Joseph Theodore Ahlstrom....Minnesota.	Gustavus Adolphus Kuncke.....Minnesota.
C. La Due Amundson.....Minnesota.	William Frederick Lasby.....Minnesota.
Albert Christian Bosel.....Minnesota.	Franklin Elmer Moorhouse.....Minnesota.
Jay Hugh Burns.....Minnesota.	George Jay Pattison.....Minnesota.
James Robert Cain.....Minnesota.	Ernest Francis Peterson.....Minnesota.
Claude Lynn Cole.....Minnesota.	Jay Nelson Pike.....Minnesota.
Samuel Lewis Conley.....Minnesota.	Frank Prendergast.....Minnesota.
Michael Francis Cook Minnesota.	George Dwight Smith.....Minnesota.
Norman Llewellyn Davies....Minnesota.	Cecil Chester Sparrow.....Minnesota.
Judson Leroy Day.....Minnesota.	William John Spring.....Minnesota.
Albert Ray Foster.....Minnesota.	James Francis Trench.....Minnesota.
Frank Anton Frankoviz.....Minnesota.	Lewis Edward Tuck.....Minnesota.
Lewis Ralph Gholz.....Minnesota.	Oscar Sidney Werring.....Minnesota.
Henry Erwin Goodspeed.....Minnesota.	Harold Warren Whitcomb.....Minnesota.
Hans Christian Hektner.....North Dakota.	George Davis Williams.....Minnesota.
George Edwin Hourn.....Minnesota.	Orlando Bigelow Wood.....Minnesota.
Walter Clyde Huestis.....Minnesota.	Frederick Spencer Yaeger.....Montana.

NATIONAL UNIVERSITY, DENTAL DEPARTMENT.

THE annual commencement exercises of the National University, Dental Department, were held Saturday, June 6, 1903, at the National Theater, Washington, D. C.

Addresses were delivered by Prof. Millard F. Thompson, D.D.S., M.D., and Prof. J. Thomas Kelley, Jr., M.D.

Hon. Richard H. Alvey, LL.D., conferred the degree of D.D.S. on the following graduates:

Gabriel Felix Coulon...Louisiana.	Thomas J. Rice.....Illinois.
Horatio D. Dawson... District of Columbia.	Frank J. Rowell.....New York.
Hector D. Kirkpatrick.Wisconsin.	Lon D. Sheets.....Iowa.
Benjamin K. Leon.... Pennsylvania.	Allen Scott Wolfe.....Kentucky.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING MAY 1903.

<i>May 5.</i> No. 726,895, to DEWITT C. FRANKLIN. Dental mouth-mirror attachment. No. 726,956, to GEO. A. LOUQUE. Artificial tooth. No. 727,483, to CHRISTOPHER S. STREET. Dental mouth-mirror. <i>May 12.</i> No. 727,736, to CLAUDE R. BASFORD. Obtunding attachment for dental drills. No. 727,811, to CHAPIN F. LAUDERDALE. Dental swaging machine.	No. 728,048, to CHAS. A. TORRANCE and GEO. S. STONE. Tooth-brush. <i>May 19.</i> No. 728,375. to CHAS. A. DAVIS. Dental vulcanizer. No. 728,633, to SAMUEL G. SUPPLEE. Dental plate. No. 728,638, to HENRY E. WEBER. Dental cuspidor. No. 728,818, to EDWIN P. WRIGHT. Dental manikin.
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A DENTIST OF THE SIXTEENTH CENTURY.

THE DENTAL COSMOS.

VOL. XLV.

AUGUST, 1903.

No. 8.

ORIGINAL COMMUNICATIONS.

THE PRINCIPAL MOLAR IN MAN, AND ITS RELATIONS TO AND BEARINGS UPON THE OTHER TEETH.

By E. A. BOGUE, M.D., D.D.S., New York City.

(Read at the seventh union meeting of the Maryland State Dental Association and the District of Columbia Dental Society, at Baltimore, May 21, 1903.)

BY principal molar I mean the first permanent molar, or what is often called the sixth-year molar. I call it the principal molar in deference to the expressions of famous anatomists more than one hundred years ago—Blainville, for example, who is much quoted by Owen; besides, I find the name so appropriate in view of more modern discoveries that I think we shall all do well to adopt it.

It gets its start soon after birth. Three to four years after the temporary teeth are all in position and all in use, the principal molar begins to make its appearance through the gum, generally at about the age of six years. As all present know, it erupts next back of the last temporary molar.

When these "principal molars" are nearly erupted, an impression of all the teeth will indicate with almost absolute accuracy whether there is to be any serious irregularity among the permanent teeth. This may appear strange, and

perhaps incomprehensible to those who have given the subject of dental dislocations little or no attention, but I think I shall demonstrate to your entire satisfaction the truth of my assertion.

I am not proposing to tell you new things, but to recall to your attention old things that you know quite as well as I do.

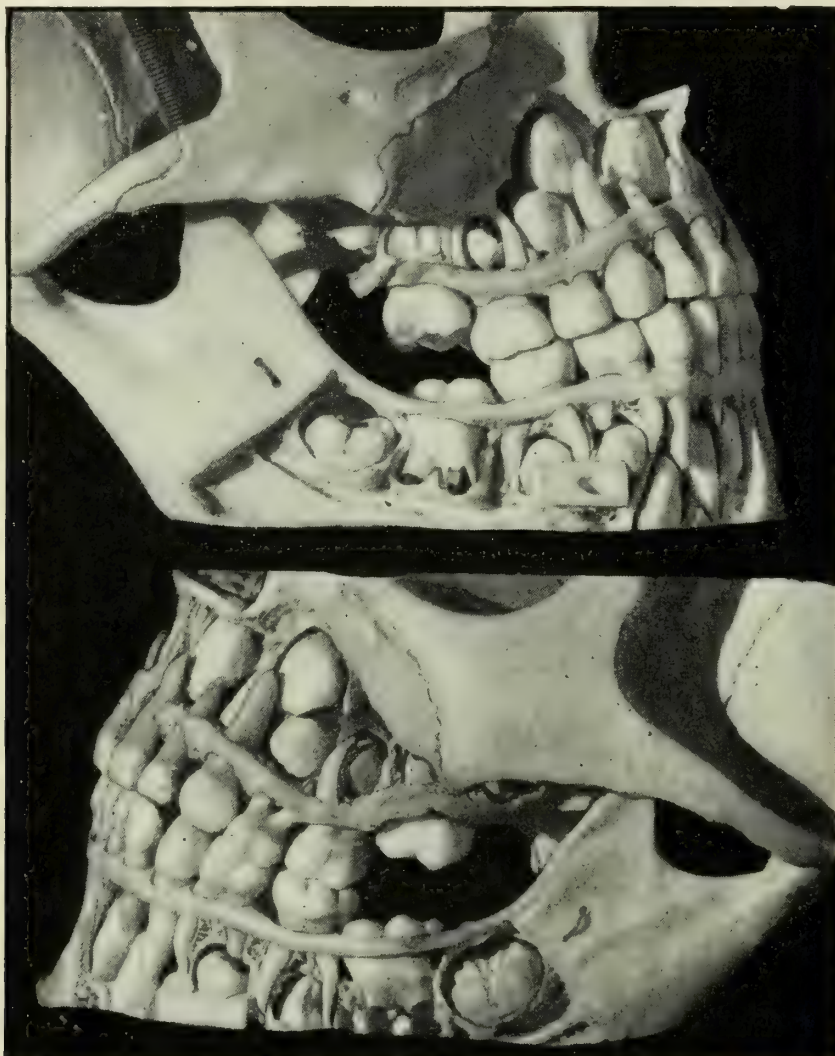
First, then, this principal molar or first permanent molar has, in the lower jaw, five cusps—though sometimes the fifth is but a rudimentary one—and four in the upper jaw. These cusps are of great consequence to the teeth. They assist in guiding the upper and lower teeth to their proper positions relatively to each other, and when these positions have been attained they assist in holding them there. If by any chance the teeth have assumed improper positions, and the cusps of the upper and lower teeth have interdigitated improperly, they assist in holding the teeth in their improper positions just about as thoroughly.

As these four principal molars erupt—the lower ones being a little in advance of the upper in point of time—they should also be one cusp in advance of the upper in point of position; that is to say, the upper molars should sit astride of the outer or buccal cusps of the lower molars, but just behind the anterior cusps.

irregularity will be most manifest among the lower teeth.

I wish now to call your attention to Dr. Thompson's picture, which you will find in Kirk's "American Dentistry." You notice that the principal molar is, as above stated, almost exactly in the middle of the arch from before back-

FIG. 1.



We all know that just room enough is required between the principal molars and the canines for two bicuspid. If, therefore, the proper occlusion of these principal molars fails, there is bound to be an irregularity of some kind. If the upper molar is in advance of the lower there will not be room between that molar and the canine for the two bicuspid, and we shall have either an irregularity of the canine or of one or both of the bicuspid.

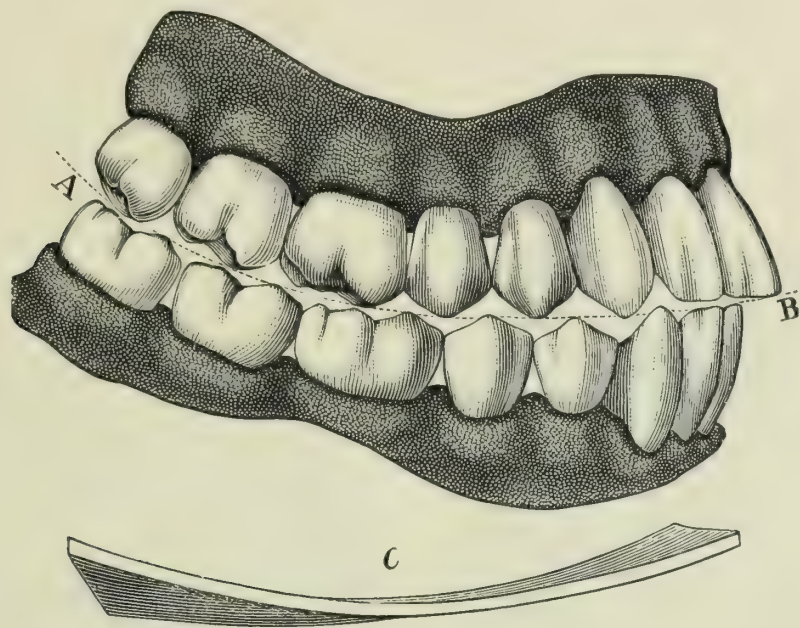
If, on the other hand, the lower molar is too far in advance of the upper, the

ward. You will notice that the three teeth—principal molar, second molar, and third molar—are all first teeth, notwithstanding they are also permanent teeth, and that they all come into the row of teeth back of the temporary set, and that the additions to the skull, to the jaws, and to the alveoli of the jaws necessary to accommodate these teeth, all take place between the time of the eruption of the first or principal molar and the eruption of the third molar or wisdom tooth.

Thus we see that the growth necessary

to the completion of the countenance, that growth which we say comes with increased years, that growth upon which so much of the canine stand the two incisors, and these complete the arches of the teeth.

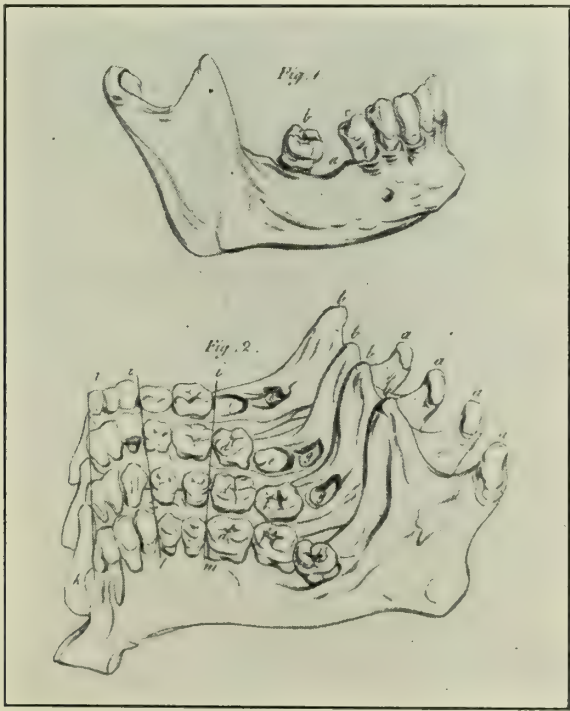
FIG. 2.



depends the character of the mature face, is largely dependent upon the presence of these three molars for such development. Now, turning to the forward lateral por-

Nearly all of the growth that has taken place in both the jaws since the eruption of the principal molar at about six years of age has taken place posteriorly to and

FIG. 3.



tion of the dental arch, we find again three teeth—two bicuspid and the canine. These complete the line and the curve from before backward. - Forward

above this molar. This growth has occurred in the interior of the skull and leaves the anterior face of this molar as the middle of the dental arches.

We have in the lower model, Fig. 4, as nearly a perfect set of teeth, both in form and arrangement, as we shall often find. Not only are these teeth theoretically perfect in position, or nearly so, but I was not able to find the least trace of decay at any point. The lady to whom they belonged was probably about thirty years of age.

FIG. 4.



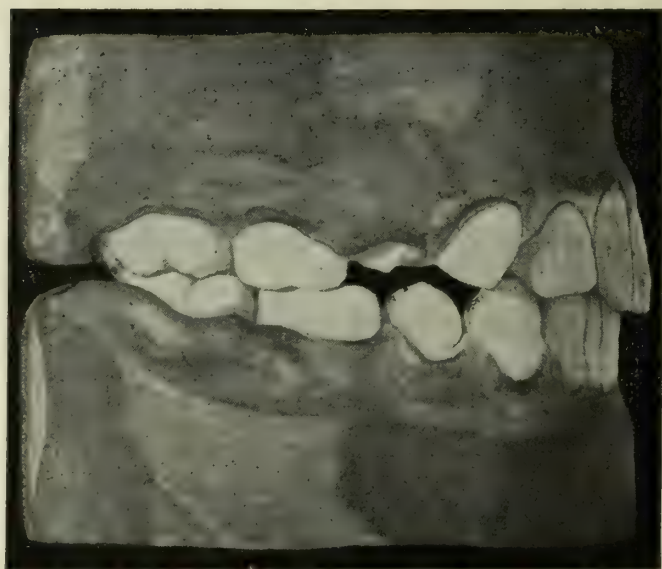
The upper model, Fig. 4, shows us a case in which the *upper* principal molars developed a very little farther forward than they should have done. The result is a slight prominence given to the canines, imparting to one of the mildest and gentlest of faces a sort of fierce look when the person shows the teeth. There is also a depression at the incisal region that accentuates still further the prominent canines.

The principal molar is, indeed, the keystone of the dental arch, and when it is realized that every member of that arch is of a size exactly appropriate to the perfect arch, it is seen that any variation in the position of this keystone causes a variation in the entire arch.

Dr. Talbot in his "Irregularities of the Teeth" (fourth edition, page 63) says: "If the teeth antagonize uniformly the arch will enlarge around evenly. If the molars are fixed, the alveolar process will expand anteriorly." Also, "The position and shape of the processes, and their relation to each other, are governed entirely by the shape and size of the teeth and roots, and not by the shape of the jaw-bone proper.

When Nature builds a set of teeth she builds a jaw to correspond, and if that jaw comes to maturity and the teeth are developed along Nature's lines and find their proper positions without accident or improper meddling, it will be found

FIG. 5.



that not only is the jaw large enough for the teeth, but also that under these conditions whatever facilitates the natural and proper development of that jaw and the natural and proper placing of those teeth into the most perfect dental arches also facilitates the development of the other facial bones. The ethmoid, sphenoid, and palate bones, as well, have developed nicely, and the senses of hearing and smelling and the power of mastication, as well as enunciation, are all promoted by this normal dental arch development.

In order to guide the teeth in their development into proper positions it is evident that it is necessary to know precisely what those proper and natural

positions are. Hence it is necessary for us to study carefully the arrangement of a good many sets of thirty-two natural teeth. There is, of course, no absolutely perfect and typical set of teeth, any more than there is *any* perfect part of the body. We should study these complete sets from a period pretty well along in life, when the teeth shall have suffered the wear and tear of forty years or more, and thence backward through the various

We will now follow through a few cases illustrating certain conditions that are frequently found in practice.

This model (Fig. 5) shows the first permanent molars above and below in perfect occlusion, and presupposes room enough forward of these teeth for all the remaining teeth to erupt with perfect regularity.

These models (Fig. 6) both show in a

FIG. 6.

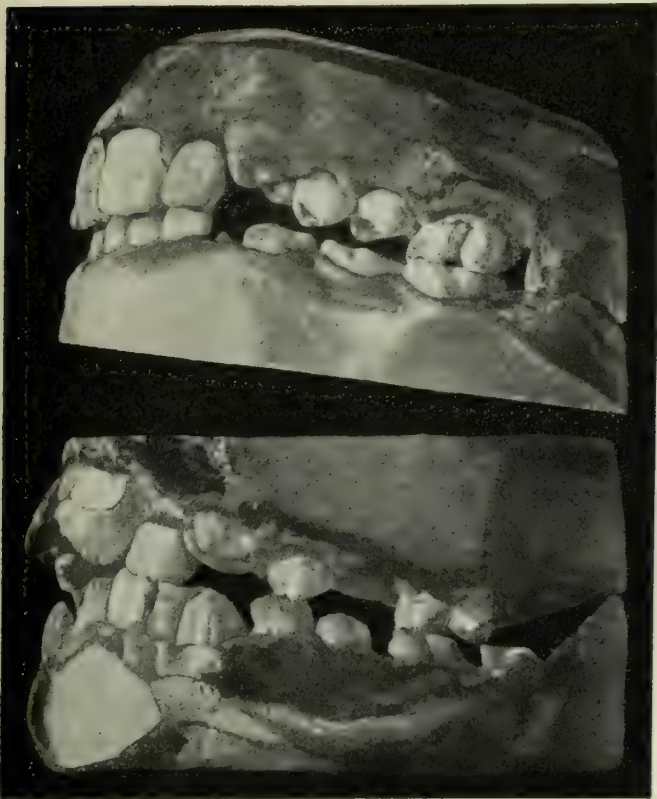
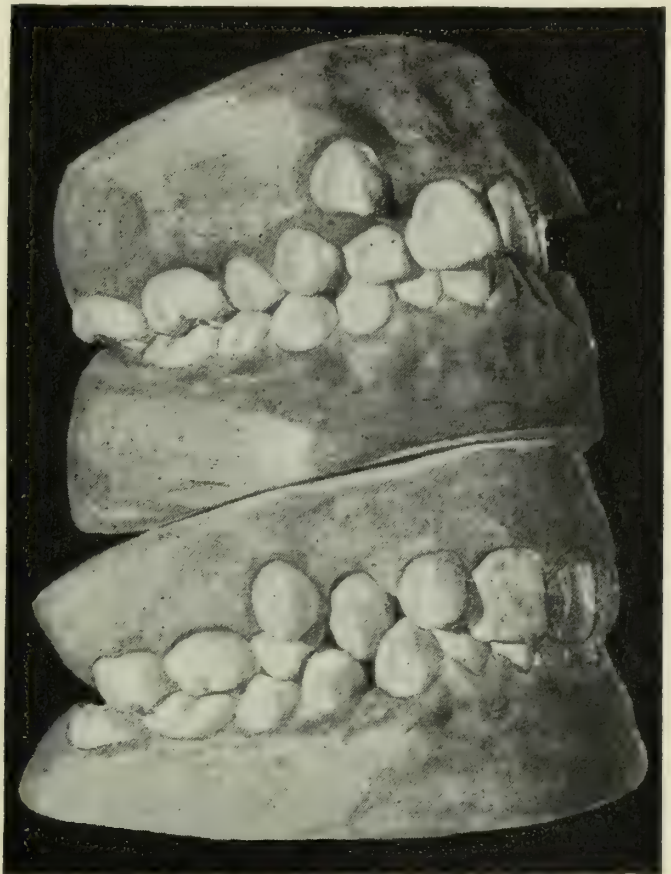


FIG. 7.



stages of accident and development to the very beginning. Upon such a study as this will depend our ability to guide and to preserve in good order the teeth of our patients from infancy to old age. If we do anything to disturb the natural ideal position of the teeth, we interfere with Nature's process of arrangement, as well as with that of self-cleansing. If we interfere with the cleansing we promote decay, for a clean tooth never decays, and when we permit the teeth to go astray because of what we call accidental circumstances that occur during the processes of formation and development of the permanent teeth we contribute to their loss.

marked degree the important office of the principal molars as just shown in the previous model. This is to sustain the jaws during the shedding of the temporary teeth and their replacement by the permanent ones.

The lower model shows the irregularity produced by lack of room, owing to a dislocation of the upper molar. Imagine what would happen to these jaws were the principal molars to be extracted at this age—about ten years. Please remember that an amputation, or an extraction, is no cure for a dislocation of any member. It is only an evasion of the difficulty, and a substitution of one

of our own mistakes for a mistake of Nature, to the greater detriment of the patient.

These two cases in Fig. 7 exemplify a condition of the principal upper molar that is not quite accurate, and would *a priori* indicate an irregularity of the molar and bicuspid teeth, and possibly of the canines, owing to the upper principal

FIG. 8.



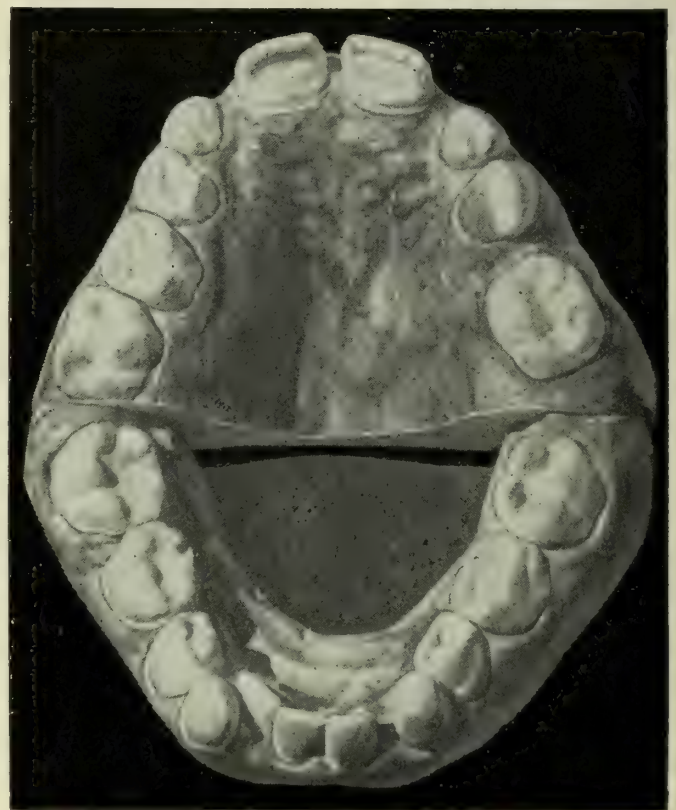
molar being one cusp in advance of what it ought to be. As an actual fact you see that the canine in one case and the bicuspid in the other have erupted out of their proper places and are unable to resume their places in the arch, because the upper molar is too far forward and does not leave enough room for all the other permanent teeth in front, hence we find in each case a tooth crowded out of position.

It is probable that the somewhat more anterior position of the molar, as well as that of one or both of the bicuspid, is *secondary*, and the effect of a too early shedding of the posterior premolar or a delay in the eruption of the canine, or

more rarely one of the bicuspid; hence it may be better—by all means safer—to say that the principal molar *assumed* a wrong position, not erupted in it.*

These two cases (Fig. 8) represent the position of the *lower* principal molar forward of what it ought to be, with a consequent diminution of room in the *lower* jaw—the effect being to throw the somewhat belated first bicuspid far out of line, in the upper model, while the canine is

FIG. 9.



rotated upon itself and thrown inward. In the lower model the impulse forward has been extended to the canines and incisors, giving the young lady a somewhat square, unseemly front part of the lower jaw.

Illustrations Nos. 9 and 10 show the models of a boy eight years old in May 1900, exhibiting the upper left molar somewhat more than a cusp in advance

*I am indebted to Dr. A. Hrdlicka, curator of physical anthropology in the National Museum at Washington, Smithsonian Institution, for the above note, as well as for a number of suggestions which have increased the accuracy of this communication.—E. A. B.

of where it should be relative to the lower molar. In this case the upper second temporary molar had fallen out of its own accord, much too early, and the permanent upper molar was found in the position which it occupies on the model when this impression was taken. A fix-

FIG. 10.



ture was put on to press this upper molar back to place. About that time the bicuspid began to erupt, and presented the appearance shown in the next two slides (Figs. 11 and 12).

Upon succeeding in getting the molar back to its proper position the bicuspid on each side of the mouth were easily drawn into their places in about ten days. Retaining plates were kept in position until the cusping of the upper and lower teeth with each other was sufficient to hold them in place, so that the heavy pressure exerted by the tongue on one side, and lighter but continuous pressure of lips and cheeks on the outer sides, completed the oblong form of the two arches, the result being what we see in the models of the finished case, which I present to you also. (Figs. 13 and 14.)

Fig. 15 contrasts the two models before and after the operations for correcting the malocclusion.

THE LESSON TO BE LEARNED FROM THESE MODELS.

The point to which your attention has been especially though indirectly called

during all this description is that the removal of one or more teeth from either of the dental arches does not, and cannot, correct any irregularity of any kind, *nor does it aid in correcting such irregularity.*

I beg your careful consideration of this statement after reading it over. I can conceive of cases of irregularity that have been neglected until maturity that might be somewhat benefited by the removal of one tooth, although a certain amount of injury would also be inflicted, but I cannot conceive of any case where the extraction of four teeth could ever be of sufficient benefit to compensate for the extra mischief done, nor is it ever good practice to extract permanent teeth from children or young persons. All necessary corrections of irregularities can be done more promptly and more easily for young people with all the teeth in place.

When this cusping of the upper with the lower teeth is carefully considered, it is recognized that the loss of even as much material as would be removed by a thin file passed between two teeth works a damage difficult, if not impossible, to wholly repair.

It follows, on the other hand, that teeth that are irregularly situated—that is, dis-located—submit to being drawn into their proper places, with the remaining teeth all in position to assist in holding them there, much more readily than they submit to be pulled into places where they did not originally belong. In the former case the alveolus bends a good deal, submits to absorption somewhat, and the teeth are brought into their proper arches and their proper contact with each other and are held by natural forces, prominent among which is their proper cusping with the antagonizing teeth of the opposite jaw. In the latter case when teeth have been extracted, the teeth to be regulated are forced against a wall of alveolus that was designed to hold them for life. The force required and the time consumed to draw them into improper positions is so much greater than would have been required had all the teeth remained in

their proper relations with each other, that from two to three years are frequently consumed in obtaining only a

I now call your attention to the main lesson that we may draw from all which has preceded.

FIG. 11.

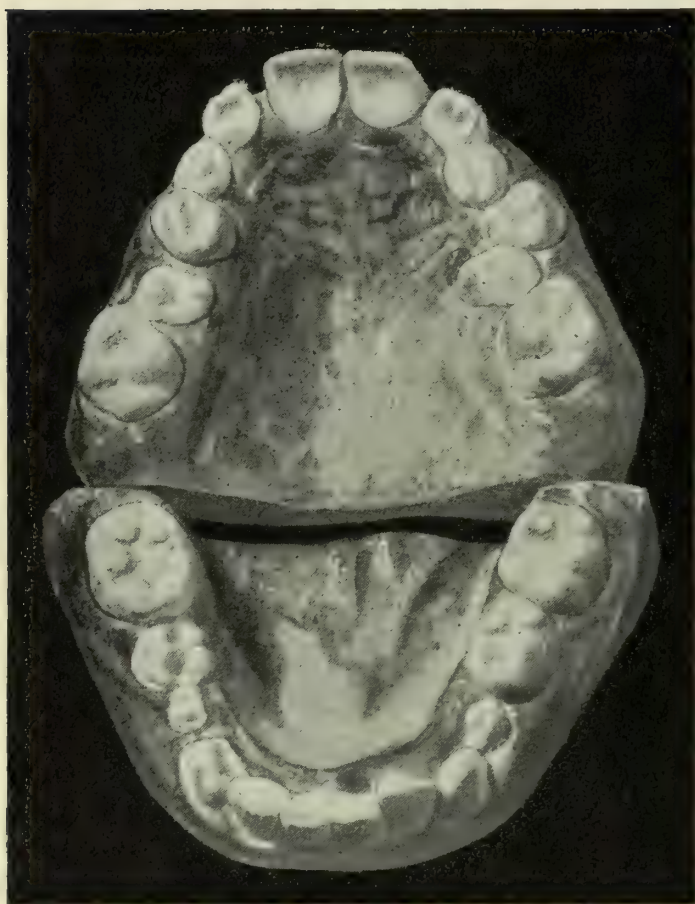


FIG. 12.



fair condition of regularity, with no proper occlusion at all, and no possibility of properly grinding the food which is taken.

FIG. 13.

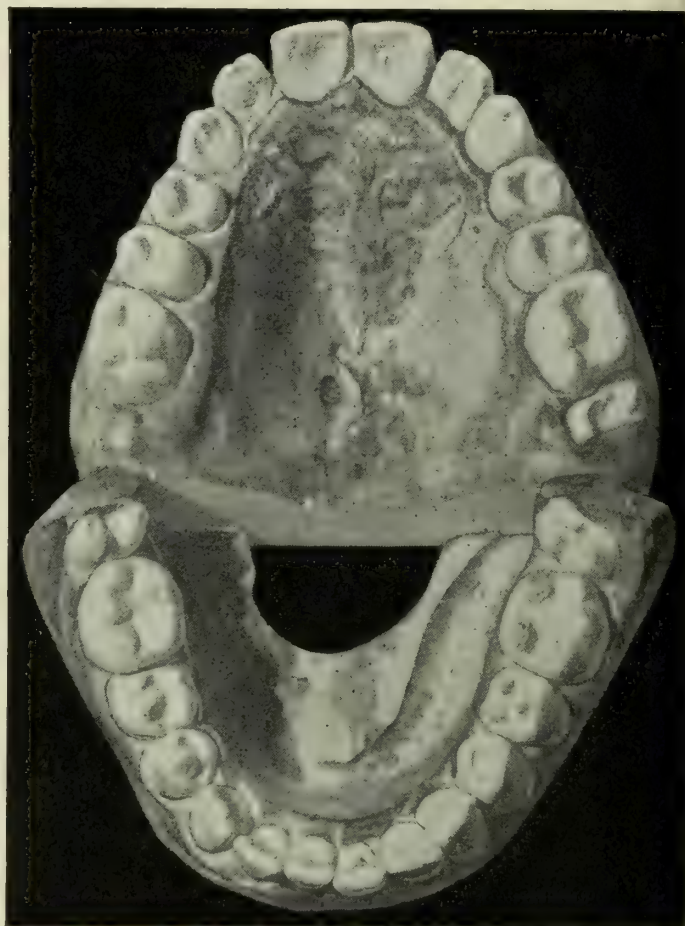
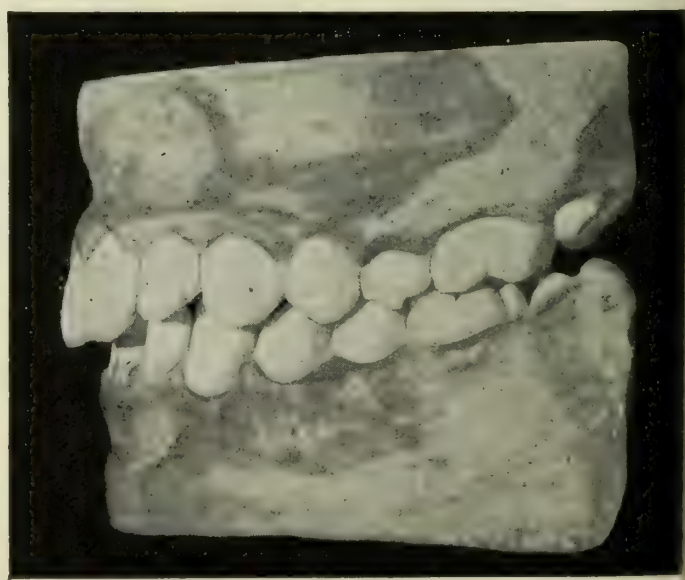


FIG. 14.



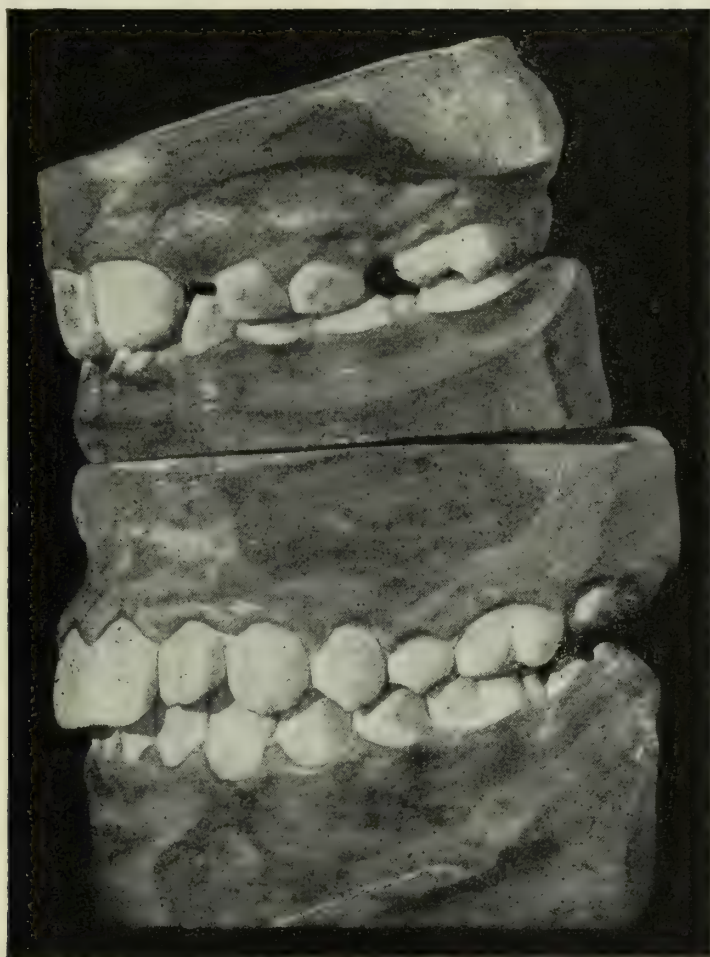
We may, at about seven years of age, perhaps even sooner than that, accurately foretell whether or not any irregularity is impending among the molar

and bicuspid teeth of a child. And we may, as soon as the first molar teeth are developed enough to attach rings to them—or, sometimes, to tie a wedge between them and the temporary molars—correct such irregularities, surely and painlessly.

The upper model here exhibited (Fig. 16) shows the mouth at six years of age

previously. The permanent central incisors have erupted and stand at a V-shaped angle, nearly if not quite three-eighths of an inch forward of where they should be. Now the question arises, How did this extreme prognathism of the upper jaw take place in so short a time, and why? And, what should be

FIG. 15.



with the first permanent molars erupted and slightly in contact, occupying their normal position, namely, with the lower molar one cusp in advance of the upper. The temporary teeth are in their places, and there is nothing especially noticeable, certainly nothing requiring attention among the teeth. Ten months later the lower model was taken. Here we find the upper molar has advanced one cusp forward of the position it ought to occupy. The four temporary teeth above and below are still in place, but the upper ones have been pushed forward of the position which they occupied ten months

done to correct it, and when should it be done?

Fig. 17 is the front view of the same mouth, and taken at the same dates as the previous slide, showing very clearly the good occlusion of the temporary teeth previous to the growth of the permanent molars, and the malocclusion of these same teeth when the permanent molars finally erupted to the length shown in the picture. These models show to me a mouth-breather, with a slight diminution of width in the region of the canines, which made it disagreeable for the child to close the teeth naturally, so it ac-

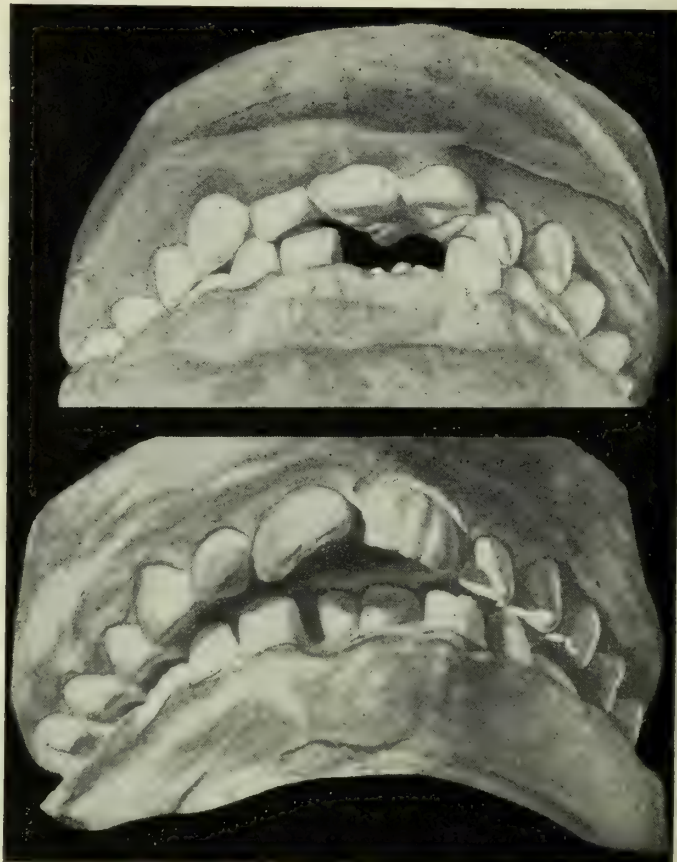
quired the habit of closing to one side to get rest. During this period the upper permanent molars grew down and failed

My own conviction is, and has been for some time, that if the principal molars can be got into their proper rela-

FIG. 16.



FIG. 17.



of proper occlusion with the lower ones, and so acquired a position in advance of what they should have had. This, unless corrected, will surely cause irregularity among the teeth forward of these molars, because of insufficient room for their eruption into their proper positions.

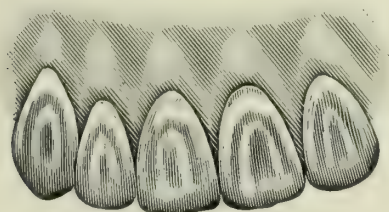
tive position at or shortly after the time of their eruption no serious irregularity will ever occur to any of the grinding teeth. Irregularities arising in the incisal region are extremely easy of correction providing the principal molars are in their proper positions.

PORCELAIN DENTAL ART: No. II.*

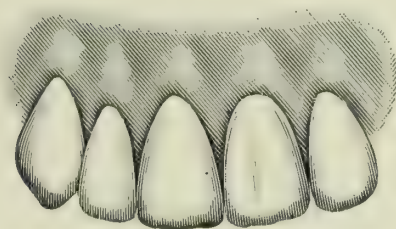
By CHARLES H. LAND, L.D.S., Detroit, Michigan.

PORCELAIN as an aid to operative dentistry is gradually developing into one of the most important and valuable branches of the art. It not only broadens the field of opportunities along the esthetic line, but as well increases the scope for many new devices of practical utility. However, it must not be assumed, as some will claim, that it will supersede all the older methods; yet to a very great extent it will take the place of many of the latter, and in numerous instances will prove to be far superior.

(M)



(N)

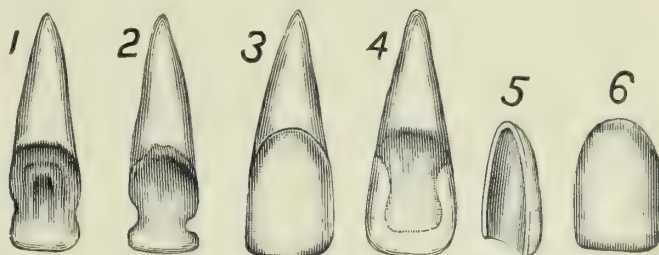


That porcelain dental art has come to stay we can be assured, and we may reasonably expect that porcelain will prove to be the real substance from which the dental profession can reach their highest ideals of true art. As evidence I will offer a few original suggestions that have been successfully reduced to practice, consisting substantially of a means by which defective teeth may be partially or entirely provided with an artificial coat of enamel. The illustration M represents five anterior teeth showing an aggravated case of erosion. The patient was a miss of about twenty years. Engraving N has been copied from a plas-

ter cast taken from a plaster impression secured after the five teeth had been successfully veneered with artificial enamel. This was formed of the same grade of porcelain from which the best artificial teeth are made.

Before proceeding to describe the method of manipulation I must first call particular attention to one of the most important adjuncts that has made such operations practical and durable; I refer to a new compound in the form of an ordinary paint and applied in a similar manner. It is composed of certain oxids and is used as a means to assist the zinc oxychlorid and zinc oxyphosphate cements to adhere homogeneously

(O)



to vitreous substances such as glass, pottery, or porcelain. Through the merits of this important improvement it has become possible to establish the perfectly flat facings on the surface of both the central incisors as seen in the engravings N and O.

Referring to engraving O, the figure 1 indicates the loss of enamel from the effects of erosion, also partial decay shown by approximal cavities; 2, the same tooth after grinding the anterior surface and removing the decay from cavities; 3, the veneer adjusted; 4, posterior view showing what remains of the lingual surface of the natural tooth and the contoured outlines of the cement, the latter serving as a means to fill and protect the cavities, also to hold

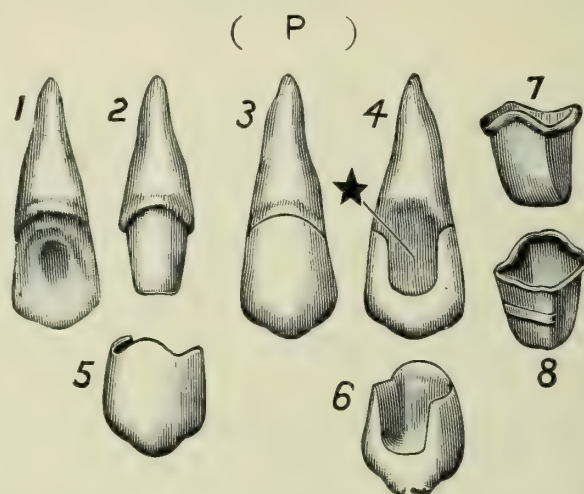
the veneer securely and permanently in place. The veneers, shown in 5 and 6, may be put on the market as articles of manufacture, or a porcelain tooth may be ground to a thin veneer and made to conform to the prepared surface as shown in 2.

To adjust a veneer on an incisor when the defective tooth may have both right and left approximal sides badly decayed, grind off one-fifth of the anterior surface, then select a porcelain tooth of the proper size and color, grind it down to a very thin veneer, then paint over the ground surface this new compound. The veneer is then placed on a thin piece of firebrick and slowly heated until all the oil in the paint is evaporated. It is then either heated in the muffle furnace or by means of a blowpipe, and gradually brought to a temperature sufficient to homogeneously establish a prepared surface that has in it the same properties as found in the usual oxyphosphate cements. Consequently, when the usual cements are added, a veneer of this description may be permanently established on frail teeth in a comparatively easy and simple manner without the necessity of pulp-devitalization.

Again referring to engraving M, I would call especial attention to the fact that each of the five teeth were quite uniformly defective, and to the casual observer a precise method of manipulating all of them after one and the same idea might easily be conceived as the best; but to one who is thoroughly experienced in porcelain technics, including the older methods of practice, certain deductions can be drawn from the double experiences as to each class of tooth—considering the circumstances, the condition, and environment—that would suggest that the most perfect results are to be accomplished by more or less modifying the methods of manipulation, notwithstanding that the material for practice were porcelain pure and simple. To impart the idea more minutely, each of the five teeth will be individually treated.

I will first select the right canine of engraving M, and show the progressive

method of manipulation. In engraving P, as also in O, R, and S, the figure 1 illustrates the eroded portions, while 2 in each case shows the appearance of the



tooth when prepared and ready to have the platinum matrix formed over it. In engraving P, 7 gives the anterior view of the metal matrix, and 8 illustrates the posterior surface of the same, while 5 and 6 show the porcelain veneer or overlap facing that has been formed from the matrix and illustrate both the posterior and anterior appearance after the matrix has been removed; 3 shows the restored tooth when the veneer is cemented in place, 4 the posterior aspect.

Looking again at 4, engraving P, I would call particular attention to the region of natural tooth-structure, and its form, indicated by a star and corresponding to the same region as seen on the matrix, 8, and indicated by a small platino-iridium bar or wire that has been soldered to the platinum hood or matrix merely as a means to stiffen the thin matrix and thus prevent its warping out of shape when exposed to high temperatures. Notice that where this bar is located no porcelain body is applied, that the thin platinum foil is merely permitted to temporarily cross this portion of the natural tooth, and the small bar of platino-iridium wire is soldered across as a means to tie the joint as well as to serve the purpose of a rib to prevent warping of the porcelain joint. The outlines of the veneer are seen in 6.

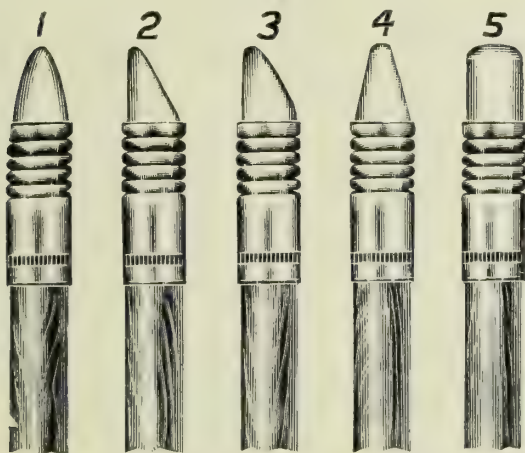
Particular attention is called to the fact that the platinum matrix, 8, has been removed from this porcelain veneer

by very carefully tearing the matrix out in small sections.

METHOD OF FORMING MATRIX.

The method of forming matrix 7, 8, of engraving P is as follows: Select a ribbon of platinum foil—the 1000; it should be well annealed either with the oxyhydrogen blowpipe or in the muffle of the electric furnace. I prefer the former, as platinum must be heated almost to its melting-point to get it practically as pliable as gold foil. Then procure a half-dozen of Dixon's "secretary pencils No. 2," and a half-dozen Dixon's "cabinet No. 2—724." They can be purchased at any book-store. It will be observed that the rubber erasing ends are the essential factors, the quality of this particular brand being unusually good for the purpose. Engraving Q represents suitable designs that may be converted into the forms 1, 2, 3, 4, 5, by using a

(Q)



coarse emery disk and dental engine. The two sizes of pencils will provide a set of very useful tools at a nominal price. To form the matrix 7 and 8 of engraving P, I select the wedge-shaped tools Nos. 2 and 3, then wrap the ribbon of platinum foil about the prepared tooth (P, 2). Have the lapped joint of the foil located on the lingual surface as indicated by the star (P, 4). When the foil has been drawn between the approximating teeth, the wedge-shaped tool is forced between and vigorously malleted; this swages the foil on one side, and No. 2 tool is allowed to remain firmly holding the left side of

the foil that is partially conformed. Then tool No. 3 is added to assist while forming the right side swage, and when this is malleted between this and the adjacent tooth have your assistant hold No. 3 firmly in position while by means of suitable steel burnishers the whole of the anterior surface is perfectly conformed as shown at 7. The lingual surface may be completed following the same method.

Attention is again called to the small bar (see P, 8) located on the lingual surface. This is composed of platino-iridium wire, B. & S. gauge No. 24; and in this connection we must recognize that the ribbon of platinum foil when drawn about 2, engraving P, will form overlapping edges whose center would be located in the line indicated by the star in 4.

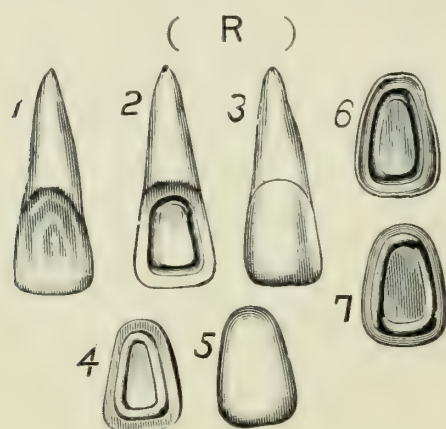
At this stage of the work it is important to know how easily one may get an excess of solder in attempting to join such thin platinum together; although pure gold be used, under such circumstances the least excess of gold added to the very thin foil, when heated to a comparatively low temperature will form an alloy with the platinum, and one of two troubles will ensue: one will either melt a hole at this point or will cause the matrix to warp. To avoid danger of this nature, first bend the platino-iridium wire to conform to the surface of the matrix, then on the approximating side of the wire solder a small quantity of pure gold, carefully lay the wire across the matrix, and apply the blowpipe. The gold will follow the wire, and this provides a remedy for the trouble.

Other important reasons for locating the joint on the lingual surface are—First, it is better obscured from view; second, the facing is more translucent; third, it is stronger in body and attachment; fourth, in case of pulp-devitalization intervening, ready accessibility may be had at the point indicated by the star (P, 4).

ENAMEL VENEERS.

The engraving R illustrates other modifications of the art, differing from the operation described in manipulating

the right canine, and it is an important example of the necessity of deviating at times from fixed rules of practice. Particular attention must again be called to the fact that all the teeth shown in illustration M were as nearly as might

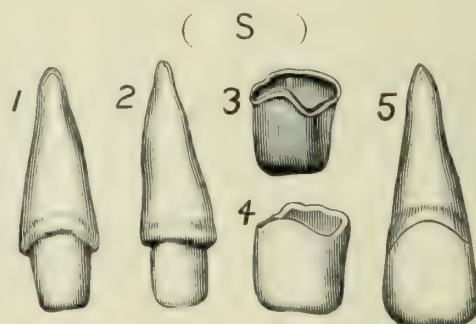


be uniformly eroded, but that in my endeavor to treat all alike I soon discovered that this particular lateral was much more sensitive than all the others had proved to be. Add to this the fact that the erosive action on the tooth-structure had almost prepared the outlines suggestive of what has been invented especially for it and accomplished after the method as shown in engraving R, in which 1 represents the extent of erosion, and 2 the prepared foundation; 4 is the posterior view of 5, which is substantially a very thin porcelain veneer composed of the same class of body as that from which our best artificial teeth are made. This has been molded and fired in the platinum matrix as shown in 6 and 7. In preparing the foundation (see 2), it was found barely possible, without causing too much pain, to reduce the anterior surface by grinding off a trifle more of the natural enamel, and by the use of a small and very sharp saw-shaped engine bur I was enabled to cut the groove in the dentin close to the enamel; this was about the twentieth part of an inch in depth and width. Then, by means of the set of tools shown in the illustration Q, including suitable burnishers, the matrix was swaged and burnished to conform to the outlines as shown in 6 and 7.

Particular attention is called to the finished product, the veneer shown at 4 and 5, and especially to the fact that

when removed from the matrix, 7, the raised portion as seen in 4 would simulate a system of tongue-and-grooving. This not only serves as a guide to direct the veneer into its proper and exact channel, but is a material aid, adding strength to the attachment. In addition to this and just previous to cementing the veneer in place, a slight undercut is formed in the groove by means of a very small saw bur in the dental engine.

Finally, not the least important feature is the aid obtained by the new compound paint or cement media, which in reality is the strongest and most durable part of this particular operation; and if I can admit of any weak features in this instance I would locate them in the mechanical devices established in the natural tooth-structure. Still, from many operations of a similar nature that have come in my practice, I feel sure that this will give a result sufficiently permanent even if it had to be renewed occasionally. At least we can be assured that the normal and healthy tooth-structure will be preserved, and in any event we know that we are safely on this side of the necessity of pulp-destruction; also that in case of failure the way is still open for the usual methods of practice.



Notice the wide and more important contrast between the results obtained on the left lateral incisor (see illustration S). In this instance the defective tooth is provided with almost an entire coating of artificial enamel. The method of procedure is almost identical with that practiced in the case of the left canine (see illustration P, 2, 5, 6), differing only in respect to one being an entire coat of enamel, while in the others only three-quarters of the natural tooth is covered.

Still further prospecting in this most valuable and interesting field, to start with I have selected a lower first molar (see illustration T). While this is copied from a case in actual practice, it is but one of numerous and similar modifications manipulated on all classes of molars and bicuspsids, altogether demonstrating a remarkable number of valuable, durable, and economical methods which were heretofore impossible with any of the older systems of practice.

As a sufficient inducement or indication for this kind of work I will first call attention to the fact that the lower molars and bicuspsids are a class of teeth that are much more observed than those

passed through the furnace repeatedly without any danger of warping the matrix. Consequently, when the matrix, as shown at 2, is finally separated from the carved crown after it has been through the furnace several times, it will appear as a perfectly finished product as shown by 4 and 5, and the interior will be an exact counterpart of the ridge as shown in 1. In other words, we have a method simulating the ordinary tongue-and-groove system as a rabbet-joint in wood-work. My individual conception in adapting the plan to dental operations is based on the theory that—First, it would have a tendency to prevent warping of the metal; second, serve as a guide

(T)



of the upper, thus demanding the style of work that will be least conspicuous. Porcelain contouring enameling and veneered plastic fillings accomplished such results, and there is every reason to believe that they will be the most durable and perfect.

Referring to the illustration T, notice especially the circumscribed tongue or ridge, 1, and the platinum matrix, 2, showing convex impression of the same; also 3, representing the inverted side.

It will be important to recognize that the platinum matrix, 2, has been so swaged and burnished that it not only conforms to this ridge as shown at 1, but in addition is provided with overlapping edges that cover a portion of the exterior of the tooth-surface, consequently the various acute angles, resulting in converting the original flat piece of pliable platinum into a much more rigid form, a condition that will keep in shape and support the exact contour and outline of the porcelain body when exposed to the highest degrees of temperature, so that when block bodies are used and carved on a form or matrix of this description they can be

to direct the crown in place, and when cemented to the tooth it would greatly increase the chances for adhesive attachment.

In presenting a technical case of this kind it is merely offered as a possibility, not a necessity, as there are many forms of decay in the same classes of teeth that would not afford the opportunity to perform such an operation, and also because there are cavities in which a simpler method would have the advantage both in ease of adaptation and permanency of results.

SOME SALIENT POINTS.

Commenting on this new art, the salient points that I wish to bring prominently to view are those relating to the naturalness, durability, ease of adaptation, especially for the patient; it is less affected by thermal changes, greatly reduces the necessity of using the rubber dam, saliva ejectors, etc. It is in line with the most perfect ideals of sanitation, reducing bacterial opportunities.

For the past two years I have been making it a regular practice to remove a great many metal caps, such as gold,

platinum, etc., also large amalgam fillings, and substituting therefor porcelain sections, crowns, facings, and veneers. In every instance there has been a change for the better in the tissues about the teeth, especially where the metal had been in contact with the gums; and in the same mouth where on one side the metal caps were allowed to remain the irritation continued, while on the substituted side where all porcelain had been placed there was a remarkable improvement shown—and this well established within three or four days.

It is too soon to formulate definite reasons for all the causes that bring about

this healthier condition. I will therefore advance but one theory at present, feeling sure it is pretty nearly correct: advocating the removal of metal caps to get rid of the overplus edge, which I recognize as the home for bacteria no matter how perfect the adaptation. One more important feature is that the patient is enabled to pass thread between the teeth, and with much greater facility remove collections of fermenting food; in fact, the space between the teeth is far more accessible for the application of lotions, tooth-paste, and the complete utility of the brush. This of itself is of distinct value.

TWO CROWNS: AN ILLUSTRATED LECTURE.

By **R. M. SANGER, D.D.S., East Orange, N. J.**

(Delivered before the New York State Dental Society at its annual meeting, Albany, May 13, 1903.)

THE two processes which I desire to show you to-night have been of such assistance to me that I deem it my duty to present them to the profession at large, and it gives me great pleasure to do so through the medium of this honorable body. I have applied for a patent on the half-collar crown in order that no one else may do so and attempt to mulct the profession for the privilege of using it. I am glad to give it to you for what it is worth, and only ask in return that it shall bear my name.

The first is an illustration of my method of restoring a fractured root, and its preparation for the reception of a crown. Of the many problems that present themselves for solution in our daily practice probably not one is more disheartening than that of an incisor or canine root which, having been crowned with a bandless crown, has finally fractured and whose crown is loose or entirely lost, while the fractured piece is still held loosely in place by the gum, the balance of the root being firm.

The first step is to carefully remove the fractured piece of root and preserve it for future use as a pattern. The hemorrhage is then checked with adrenalin chlorid or some good hemostatic, the raw surface cauterized with trichloroacetic acid, and anesthetized with cocain. The space between the root and gum is then packed with gutta-percha and the patient dismissed for the day.

As you are aware, gutta-percha expands, and the gum will be forced back sufficiently to give free access to the edges of the root along the line of fracture, presenting a condition such as is illustrated in Fig. 1. At the same time the gum will heal, so that little or no hemorrhage will occur during the subsequent progress of the work.

A piece of soft platinum plate, gauge No. 32, is cut to about the shape of Fig. 2, the fractured piece being used to determine the shape and size of the apron portion (Fig. 2, A), while the wings (B, B, Fig. 2) are made sufficiently long to reach around the entire root in the

form of a collar. With an ordinary pair of clasp-benders the platinum is shaped to fit the fractured piece of root (Fig. 3), and it is then placed in the mouth

FIG. 1.

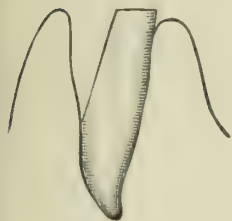
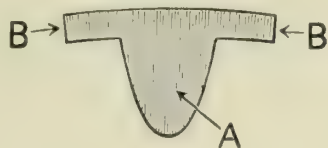


FIG. 2.



and the wings are brought around the root to complete the collar form. It is then removed and soldered, and we have a collar with apron as represented in Fig. 4. A piece of flat platinum plate, gauge No. 30, is then placed across the end of the collar mesio-distally and soldered to the edges. (Fig. 5, A, A.) It is then placed back on the root and perforated

FIG. 3.



FIG. 4.

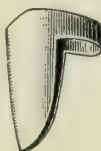


FIG. 5.



for the reception of the tube and pin. A seamless platinum tube is procured by fracturing an Ash tube-tooth. A piece of round platino-iridium wire which perfectly fits the tube is passed through the tooth and held in position while the tooth is broken away from the tube, thus preventing the marring of the tube, and you have a strong platinum tube with a pin which fits it exactly.

With your collar apron in position in the root the tube and pin are pushed through the perforation and up into the canal as far as possible, and then with a sharp instrument or penknife the tube is split and folded down on the flat piece as illustrated at B, Fig. 5. It is then removed and soldered and we have the construction represented by Fig. 6, which is ready for final placing on the root in the mouth. The method of setting is as follows: The pin is placed in the tube to prevent the oxyphosphate from passing into the tube and to serve as a handle to hold the piece firmly while packing

the amalgam. A small amount of cement is placed in the canal and around the end of the tube (Fig. 6, A), also around the inside of the band, where it engages the root (Fig. 6, B). The piece is then placed on the root and held firmly until the cement hardens, when the balance of the space around the pin and between the apron and the root where the fracture occurred, is packed with a quick-setting amalgam through the openings at A, A, Fig. 7. The last illustration (Fig. 7) shows the work com-

FIG. 6.

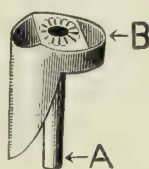
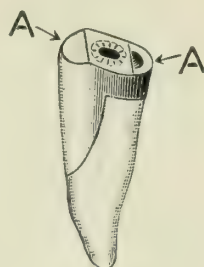


FIG. 7.



pleted and ready for the reception of the crown, which is made with a band after the Richmond pattern, the platino-iridium wire being used as the permanent pin as illustrated in the working model which I have passed around.*

THE SANGER HALF-COLLAR CROWN.

The second crown to which I desire to call your attention is what I have denominated the Sanger half-collar crown. I am fully aware of the fact that half-collar crowns are not new, but the difficult and unsatisfactory methods of constructing them have deterred many from attempting their use, preference being given to the full collar. It is in the belief that I have found a simpler method of constructing a crown which will give all the advantages and none of the disadvantages of the collar crown that I make this presentation to you.

The procedure is as follows: A piece of pure gold plate, gauge No. 30, is cut to about the shape of Fig. 8. Being annealed, it is grasped at the straightest edge (Fig. 8, A) with a pair of clasp-benders, and hammered down to the flat end of the benders with a small riveting

*I have recently learned that Ash & Son will furnish the tubing and wire to fit, on application.

hammer (Fig. 9) until it assumes the shape shown in Figs. 10 and 11. With a pair of curved shears it is cut along the collar on the outside at A, A, Fig. 10, and

FIG. 8.



trimmed down so that the metal tongue will pass between the two free edges of the collar, as in Fig. 12. It is then placed

FIG. 9.

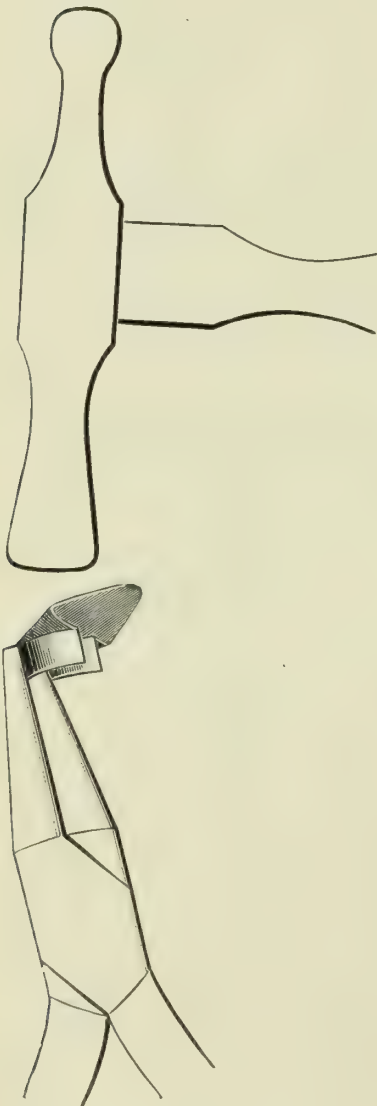


FIG. 10.

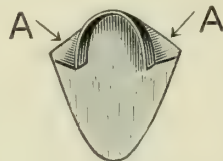


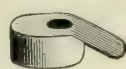
FIG. 11.



FIG. 12.



FIG. 13.



on the root in the mouth and burnished and trimmed to fit, the root having been previously shaped as in Fig. 17. It is then carefully removed and soldered along the free edges on the outside and

the points cut off, giving you a half-collar cap, as shown in Fig. 13, which perfectly fits the root. The balance of the work is the same as in the construction of any backed and soldered crown.

If, however, you desire to construct an all-porcelain crown, No. 32 gauge platinum is used instead of pure gold, and the two ends (Fig. 12, A) are not cut off,

FIG. 14. FIG. 15.

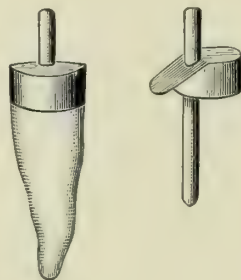
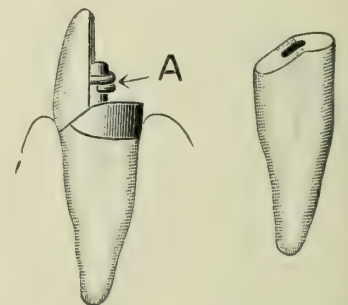


FIG. 16.

FIG. 17.



but are burnished down on to the tongue, when the cap is burnished to shape in the mouth, to give additional stiffness, and then soldered with pure gold or platinum solder where they lap. The cap is again placed on the root and a platino-iridium pin is pushed through the cap, but instead of cutting it flush it is allowed to extend above the cap, as in Figs. 14 and 15. A little sticky wax is placed on the pin and cap, and they are carefully withdrawn and soldered together on the outside. A cross-pin plate tooth is selected and ground to fit in the mouth with the cap and pin in position, the pins are bent around the post as in Fig. 16, and, with the aid of a little sticky wax, it is all withdrawn, invested, and soldered at A, Fig. 16. This holds the facing firmly in position while the porcelain is built up and baked to the proper contour on the lingual surface.

Now, it must be obvious to you all that a half-collar cap made in this way has the advantage of giving you all the strength of a full-collar crown, the bevel on the front of the root corresponding to the front part of the band of the full collar without its unsightliness, while the half collar at the back gives strength where the strain is greatest.

APPROXIMAL FILLINGS IN THE INCISORS.

By WM. CRENSHAW, D.D.S., Atlanta, Ga.,

PROFESSOR OF OPERATIVE DENTISTRY, ATLANTA DENTAL COLLEGE.

UNTIL the difficulties in the technic and the shade-matching aspects of porcelain inlay work shall have been overcome and placed within the manipulative ability of the average dentist, he must necessarily continue to fill the anterior teeth with gold.

The effort to improve the appearance of the teeth in filling operations by the use of porcelain inlay, and thus doing away with the glare of gold, is claiming serious and needed attention from the profession. But so much is yet to be done in the perfecting of the work that conservative dentists will wait to see what comes of it before adopting it. And when the problem of shades and shadows and technic difficulties has been definitely settled, the serious objection of cementing the filling in place remains. This method of fastening fillings in the teeth has always been a questionable one, and is far from satisfactory.

The importance of the porcelain inlay, however, makes it imperative, if possible, for this style of work to be cleared of its objections and difficulties, and to be made the equal or the superior of the best gold work in point of appearance, preservation, and permanence.

Poorly matched porcelain inlays are, in the eyes of the dentist and of a discriminating patron, a most unsightly spectacle. The fact is, they are not an improvement in appearance on good gold work, and not comparable to it in point of permanence.

FAILURES WITH COHESIVE GOLD.

To be sure, gold work has been bad enough long enough, but the failure of it has been due in great part to imperfect methods of manipulation, and more particularly to the extensive and almost ex-

clusive use of cohesive gold. For this latter reason, the admission often heard that the life of a gold filling is five, six, or eight years, is due.

By the older skilful manipulators of soft gold the life of a gold filling was not thus limited. This was not heard of until after cohesive gold came in vogue; nor is it admitted by those of us who have had opportunity to observe and judge of the soft-gold work done by Maynard, Emerson, the Badger brothers, *et al.*

COMBINATION OF COHESIVE AND NON-COHESIVE GOLD.

Dr. J. Foster Flagg's memorable statement, that in proportion as teeth needed to be saved gold was the poorest material with which to do it was eminently true of cohesive gold, eminently untrue of non-cohesive, and untrue of both cohesive and non-cohesive when properly used in combination. No one fact has been more clearly proved in the past thirty years than that a combination of soft and non-cohesive gold will save teeth indefinitely, and more nearly all textures of teeth than any other one material. Therefore, if Dr. Flagg had in mind cohesive gold work when he made the sweeping statement, he uttered that which has been proved to every observant dentist; but if it was made upon observations of soft-gold work, or a combination of the two, he must have reported on poorly executed work of the kind.

Cohesive gold is crystalline in form, and when malleted against fibrous structures, as cementum and dentin, will, on account of this fact and of the incompatible nature of cohesive gold with the cementum and dentin, result in recurrent decay.

This is due in part, the writer believes, to three causes, namely—(1) to the seeping or weeping of neural matter from the lacunæ and canaliculi at the base of the filling; (2) to the leaking of moisture at the surface margins; and (3) in some measure—we know not how much—to the concussion of malleting. Cohesive gold, therefore, can never on account of its crystalline nature be adapted to prevent seepage perfectly in contact with cementum and dentin, unless there be interposed a sealing or bonding material such as is furnished in cements or resinous cavity linings.

OBJECT OF CAVITY LINING.

The object of the cavity lining is to seal the lacunæ and canaliculi and to fill the interstices resulting from the points and angles of the crystals resting against the wall surface of the cavity. The life of the filling would then depend on the life of the bonding material, and the writer believes that only in this way the success of cohesive gold shall be attained in cementum and dentin margins.

Non-cohesive gold, being non-crystalline or structureless in its molecular arrangement, is more adaptable to cavity walls, and is therefore susceptible of such adaptation as prevents seepage internally and externally and bars capillary force, a factor to be reckoned with in this connection. Its structureless form and cushion-like softness not only prevent injury to the margins under malleting, but bar moisture by corking it out. Tin foil is non-crystalline and structureless in form, and for this reason adapts more perfectly than cohesive gold; and to this fact largely is due its record for tooth-preservation.

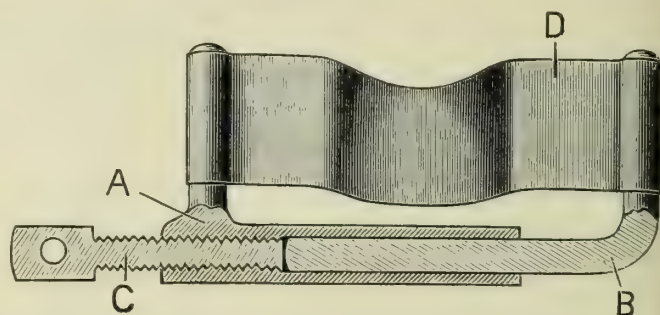
In the effort to improve gold work in approximal cavities of the anterior teeth by a method which controls soft gold and practically does away with cohesive, the new front-tooth device is offered.

MATRIX FOR THE FRONT TEETH.

Fig. 1 shows the device enlarged as it appears before being placed in position about the teeth, and with the lower part shown in section. The arms A and B

project through the loops formed on the ends of the metallic ribbon D, the thickness of which is four one-thousandths of an inch, and which may be passed be-

FIG. 1.



tween teeth of rigid contact. The parts A and B are separable, and when the tension screw C is turned in, the arm B is extended, which puts the ribbon D under tension.

Fig. 2 shows a lingual view of four incisors with the matrix ribbon in position before it has been adapted at the

FIG. 2.



FIG. 3.



incisal edge. Fig. 3 shows the ribbon crimped and soldered, which adapts it closely to the tooth at the incisal edge, and to the surface of the tooth beneath the ribbon.

Fig. 4 presents a labial view with the device in position, and shows how cavities which extend through and open on the lingual face of the tooth (see Figs. 2 and 3) may be floored and brought into simple form, a labial view of which is shown in the unfilled cavity of Fig. 4.

Fig. 5 is a view looking into the cutting edges of the teeth, and exhibits the labial displacement of the left central incisor by the action of the device.

Fig. 6 shows a means of taking up slack in the ribbon, if this should become necessary, by slipping the slitted arm B

—or both A and B, see Fig. 1—astride of the ribbon as shown in Fig. 6. By this means, if at any time the tension

FIG. 4.

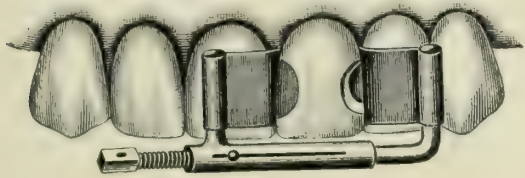


FIG. 5.

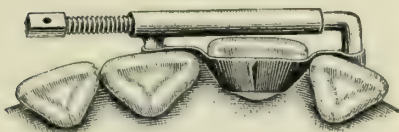
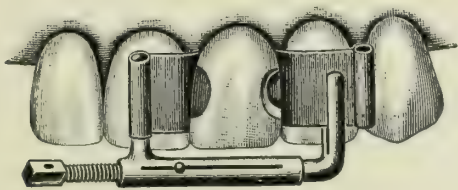


FIG. 6.



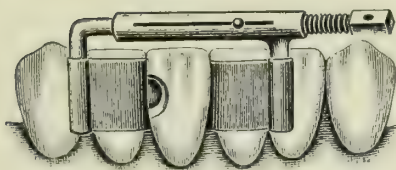
screw should be run in to its limit, additional tension can be obtained without removing the ribbon.

Fig. 7 is an application of the ribbon to the lower incisors; it must ordinarily be placed between the teeth before

FIG. 7.



FIG. 8.



applying the retainer; and Fig. 8, the same figure with the retainer in position.

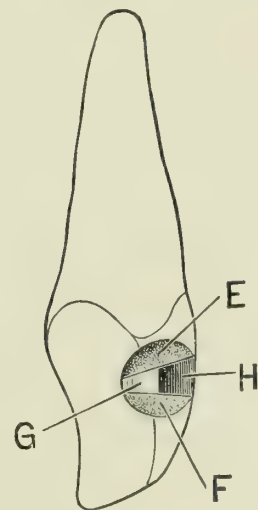
FILLING AN APPROXIMAL CAVITY WITH COHESIVE AND NON-COHESIVE GOLD.

Fig. 9 shows an approximal cavity in a central incisor three-fourths filled by the aid of the matrix, after which the matrix is removed. The subdivisions of the filling, lettered E, F, and G, are made of soft gold, leaving the space marked H

to be filled with cohesive gold. The procedure which best accomplishes this is as follows: If the cavity be a large one, take a size No. 3 or No. 4 soft gold cylinder and double it upon itself and again crosswise, making a firm cushion. Let this cushion be large enough to squeeze into the cavity. Take a foot-shaped plugger with light serrations (No. 410 S. S. W. or similar pattern) and press this first cushion into the undercuts of the cavity at E. After settling it by hand pressure, take a suitable foot-shape plugger (No. 410 answers well) on the automatic mallet, and while holding down at one end of the cushion, mallet the other, after which change instruments about and mallet the opposite end.

After this is done, treat the opposite side of the cavity at F in the same way.

FIG. 9.



When the F subdivision is condensed, use a size No. 2 cylinder folded once upon itself, and introduce end-wise at G, which when condensed keys E and F in place. If the cavity be a large one it will require two of the size No. 2 cylinders to bring this part of the filling to the center of the cavity, which is necessary in order to brace E and F in place.

The writer cautions against using small soft cylinders with which to make the key-block G; because when condensed they do not build up high enough to obtain the necessary lateral bearing against blocks E and F to hold firmly in place. Neither should cohesive gold in any form be used here.

It will be observed from the lines of the cavity division in Fig. 9 that the cavity is to be filled from the labial side, and that it extends through into the lingual face of the tooth, also that the matrix ribbon which has been removed to show the plan of the filling envelops and embraces the tooth in such manner as to floor the lingual portion of the cavity, as may be seen in Figs. 3 and 4.

The action of the device not only moves the tooth forward to be filled, as seen in Fig. 5, so that it may be got at easily, but transforms a difficult cavity into one of easy, simple form.

In the instances where the opening of the cavity is to the lingual aspect with a labial wall to be preserved, the device operates with as much favor in filling from the lingual as from the labial. (See Figs. 3 and 5.) In these figures the action of the device is to move forward the left central, and depress the right central and left lateral. (See Fig. 5.)

When the filling is made from the lingual aspect, the lines of the subdivisions of the filling, Fig. 9, would be reversed, and the key-block G would be placed at H, with H occupying the position of G.

GOLD PREPARATIONS PREFERRED.

The preparation of gold best liked by the writer, and that which he employs in these fillings, is made from No. 4 soft gold foil in the following manner: Take a full leaf of the foil, and with clean hands crimple or wrinkle it. Straighten this out, leaving the foil undulated, when it should be loosely folded three times upon itself and loosely twisted. The twist thus made should be cut into three to five pieces, owing to the size of the cavity to be filled. The larger cavities will take cushions at E and F, made of one-third, and occasionally one-half, of the leaf twisted as described. To make this twist into the cushion, if the cavity be a large one, take one-third of the twisted leaf and double it two to three times upon itself, when a cushion will be had that acts better for the purposes needed than when formed from cylinders.

When the twist as described is cut off into pieces of whatever length, we have the equivalent of a size No. 1 cylinder; when doubled, we have the equivalent of a size No. 2; and doubled twice, of a size No. 4. Doubling the third time would make the equivalent of a size No. 8 cylinder and make the cushion into a firm one. Yet it is more adaptable in this form, as it will bind and lock into place under firm pressure with less danger of moving than when the subdivisions are made of light, soft cylinders or other light, soft, non-cohesive gold preparations. Large cushions in comparison with those ordinarily used in cavities of given size, whether made from cylinders or the foil, are not only more safely and perfectly adapted, but more quickly done, and with better general results. It is practically impossible to make impervious joints out of the diminutive soft cylinders, such as sizes Nos. $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, etc., because there is not material enough in them when condensed or in the act of condensing to bind and lock them firmly in place. All soft gold and tin cylinders are too soft as received from the manufacturer, but they may be doubled and partially condensed into suitable form. The firm—almost hard—cylinders and cushions are the forms in which the best soft gold workers have used them.

The filling as shown in Fig. 9 has a soft gold adaptation three-fourths or more around the margin, with the subdivision H made of cohesive gold, the margin here being in strong enamel wall.

In the formation of cushions or pellets for small to medium-size approximal cavities, whether making the cushions from cylinders or from the foil, it must be remembered that the size of the cushion depends on the size of the cavity. For small cavities the leaf of foil, after being undulated, should be cut in halves, and for very small ones into three parts, and each of these parts folded and twisted and cut into four to five pieces. The pieces are then doubled as before described. The size, therefore, of the cavity determines the size of the cushion, and the suggestions made ought to enable

the operator to get at the proportions without difficulty.

PLUGGERS REQUIRED.

The pluggers necessary to make the soft gold part of these fillings will be found in the Nos. 409, 410, S. S. W. The pluggers for doing the cohesive gold

FIG. 10.

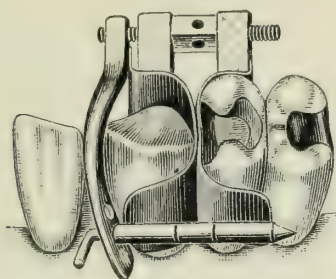
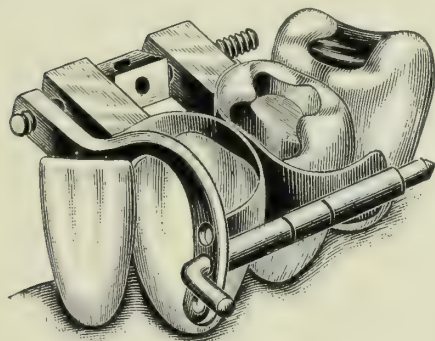


FIG. 11.



part are such as the operator ordinarily uses; but the writer prefers the Nos. 19 and 21, with the short bend and extra-deep serrations, as these are needed for tacking or pricking by interdigitation the cohesive into the non-cohesive gold.

The advantage of this method of filling at these points is that we have a difficult class of cavities brought into simple form, enabling us to condense soft gold satisfactorily. The tooth is moved forward enough to enable the operator to give the oval or contour needed. The metallic strip forming the matrix, when removed from between the teeth, leaves a space into which a thin strip may be passed for polishing. Fillings at these points may be made in one-third of the time necessary for the making of cohesive work, with the advantages accruing in favor of soft gold. The method makes it easier to fill these teeth well from the lingual side. It serves better, if any difference, in the lower incisors than in the upper, because without such

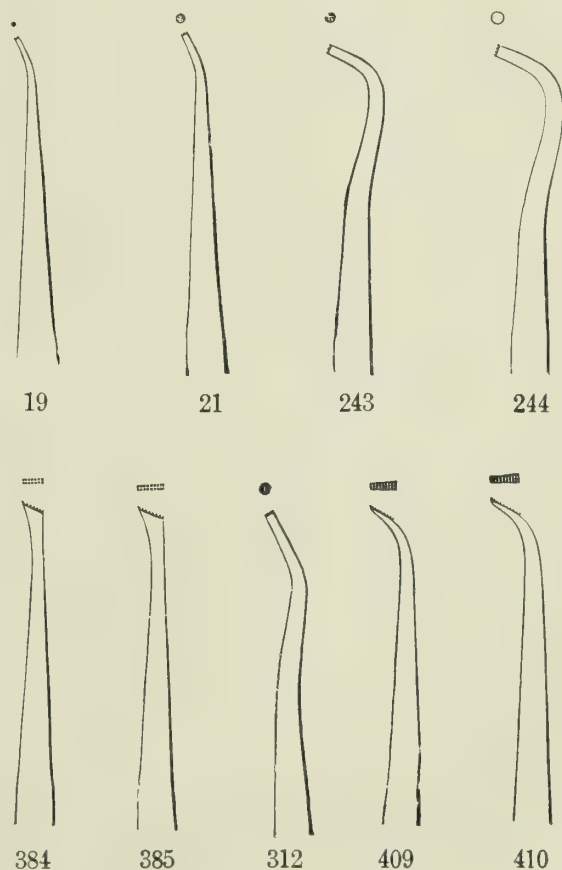
aid the lower teeth are more difficult to fill. The device applies from canine to canine above and below, and has ample power for moving the teeth, which movement is labio-lingual instead of lateral as with separators. The device may also be employed to advantage for holding platinum foil while it is burnished in the cavity for inlay matrices.

Fig. 10 shows a necessary adjunct to the contour matrix, when the device is to be employed between the canine and first bicuspid.

Owing to the difference of these teeth in physical form, the band embracing the canine will ordinarily, under pressure of the tension screw, be forced against the lingual face and slide out of position. The brace shown in the illustration prevents this collapse and holds the device in alignment. Fig. 11 is an enlarged view, showing more clearly the application of the brace.

The pluggers to be employed in the soft and cohesive gold work in connection

FIG. 12.



with the contour matrix are the Nos. 19, 21, 243, 244, 312, 384, 385. Nos. 409 and 410 should be serrated on the throat side as well as on the face.

THE TRAINED DENTAL NURSE.

By M. L. RHEIN, M.D., D.D.S.

(Read before the New York State Dental Society at its annual meeting, Albany, May 13, 1903.)

THE art and handicraft of dentistry has taught us how to cope with dental caries successfully, so that no person in the civilized world at the present day need lose a single tooth from this cause alone.

Many people, however willing they may be to employ our services, are constantly losing teeth in consequence of various pathological disturbances of the periodontal tissues. When this lack of inherent vitality of the tooth's periosteum has reached a certain stage, where not only seven-eighths of the root surfaces are covered by nodular secretions, but retrograde metamorphosis in its peculiar way is working toward sepsis and the destruction of cell tissues, we realize that such affected teeth are beyond human intervention. We also know that these very teeth, doomed to be lost as they are when too little vital connection is left, could have been preserved indefinitely if proper hygienic care and treatment had been instituted at the right time and kept up in a systematic way at regular intervals.

Preventive medicine, with its accompanying benefits, has been well understood since the time that Jenner proclaimed the virtues of vaccination. Since then, prophylaxis has invaded the domain of nearly every disease, and its science and practice is daily increasing and its field of usefulness becoming better known.

PERIOD OF SUSCEPTIBILITY TO CARIES.

The most disturbing period as far as the action of caries is concerned takes place in early life up to the age of puberty. During this time there is very little immunity present and we are well acquainted with the action of the *Lepto-*

thrux racemosa. It is deposited in the well-known gelatinous plaques on the enameled surface of the teeth, and only by means of the presence of these plaques can the action of caries proceed. It has been well demonstrated that if these accretions are kept thoroughly removed and the surface of the teeth kept polished there will be no danger from the action of the caries. This necessitates the very frequent cleansing and polishing of the teeth in order to give the benefit of prophylactic treatment of dental caries to our patients.

CLEANSING AND POLISHING THE TEETH IN PYORRHEA.

In pyorrhea alveolaris the cleansing and polishing of every portion of exposed tooth-surface, at regular intervals, in such a way as to preserve the tone and health of the contiguous capillary circulation will indefinitely preserve the life and stability of the human teeth. With a full knowledge of the inestimable value resulting from such systematic treatment, it is painful to admit that as a rule the general public get absolutely no benefit from the knowledge of the profession on this subject.

Like many other virtues, prophylactic treatment of the teeth is well understood by all and practiced by only a few dentists. It is scarcely necessary for me to attempt to draw a pen picture of what the dentist does under the pretense of cleaning teeth when requested to perform this service, or to speak of the wilful neglect thereof by the majority, when no special demand is made by the patient. You have all examined the mouths of such patients, who inform you that for years their mouths have had the constant care of Dr. X, and he has

cleaned their teeth every year. You have found secretions of years deposited on the roots. The more posterior and inaccessible the teeth, the greater the extent of deposits. You are not surprised at such teeth becoming loose, with a surrounding pericementum more or less inflamed, and corresponding loss of soft tissue from superficial necrosis.

They come to us in all stages of tissue loss, from those easily cured to those irretrievably lost. You cannot fail to recognize the picture, and neither can you fail to place the responsibility for this wholesale destruction of human teeth upon the dentist, who has failed to apply the principles of preventive medicine. Are we to assume from a study of this sad picture that our calling is made up of men lacking in character and principle? Most emphatically, No! In no specialty will be found men with higher attributes of character, in every sense of the word, than in this of ours.

WHY PROPHYLAXIS IS NEGLECTED.

There are very good reasons why this most important duty to our patients is seriously neglected. The necessity for performing the operations immediately necessary for the repair of existing lesions in tooth-structure and adjacent tissue is of paramount importance; they are more than sufficient to take up all the time of the man with an average practice. The difficulty of receiving commensurate pay for the hours of time required in faithfully carrying out the treatment by prophylaxis, brings up the question of expediency. It is true that Dr. Smith of Philadelphia claims to personally give his patients this treatment at regular intervals. If an effort were made to follow out this method in an average practice there would be time left for nothing else. It certainly is the consensus of professional opinion that the busy practitioner cannot give up his valuable time for this tedious, monotonous, and irksome labor, however important it may be for the salvation of the human teeth. A small number of us have tried to solve this important prob-

lem by employing an assistant practitioner to attend to this department. In the judgment of your essayist, who has tried this method for twelve years, it has failed to satisfactorily solve the problem.

THE DENTAL NURSE.

The employment, in a private office, of a graduate to make a specialty of this work is very likely the best remedy we have had at our disposal up to the present time. The greatest objection to the plan is the inability to retain a graduate possessing ordinary ambition and talent a very great length of time in this position. It is impossible to obtain satisfactory results in this treatment if it be necessary every year or two to place a new assistant in this department. The patients object to these changes and cannot fail to contrast the work of the new assistant, who has to be freshly taught the character of the work desired, with the final work of the last assistant which has become well-nigh faultless from a couple of years of constant practice. In discussing this subject with prominent men, it has been generally conceded that far better results could be obtained if suitable female assistants, not graduates, were especially trained and employed for this work.

In some of the states the examining boards have threatened prosecution for infraction of the dental law if such a course be pursued; consequently it has not been adopted, much to the loss of the general public. This brings up the question whether the cleansing and polishing of the teeth, massaging the gums, and the application of remedial agents by non-graduate assistants, under specific prescriptions and directions of the attending stomatologists, are infractions of the law.

It might as well be said that the administration of drugs hypodermically, the introduction of sounds and catheters, lavage and enemata, the dressing of wounds, and numerous other services performed under medical direction by trained nurses are all infractions of the medical law.

Take away the trained nurses from the physician or the surgeon and it would be apparent at a glance how it would interfere with the number of his cases, to say nothing of the inferiority of the resulting attention which is such an important adjunct whenever the nurse is in attendance.

If this correctly describes existing conditions, it follows as a natural conclusion that the problem of how to systematically carry out the prescriptions of dental prophylaxis would be easily solved by the introduction of the trained dental nurse.

In our state, during the past session of the legislature two bills were introduced for placing the trained nurse under the jurisdiction of the state Board of Regents, which necessitates that they should possess the proper qualifications in education and practice.* In view of the high esteem held for the work of the trained nurse, it appears remarkable that the sphere of her usefulness has not long since been extended to our own specialty.

TRAINING OF DENTAL NURSES.

It would be an easy matter to add to the training-schools for nurses a department of dental nurses. Applicants for admission to such a course should be required to pass a satisfactory preliminary examination. Outside of the general didactic instruction which they would receive, they should obtain additional instruction in regard to the oral cavity, etc., from a dental member of the school's faculty. They would also receive their manual training under the same supervision, and in the hospital material they would find ample opportunity for perfecting their working technique.

It is difficult to estimate in advance how much benefit would accrue to a large percentage of hospital cases if their mouths could be properly cleansed and rendered sterile. Would it be claiming too much to say that there are serious conditions where such treatment prop-

erly administered might prove the turning-point toward recovery, or, in organic diseases, toward a material improvement in the general condition? Perhaps their greatest sphere of usefulness would be to place the mouths of patients in a sterile condition preliminary to undergoing surgical operations. When we consider all the devices used in the modern operating room, all devoted to obtaining ideal aseptic conditions; when we consider the patient anesthetized in an atmosphere barren of pus germs—with the single exception that too frequently the patient's mouth is redolent with putrescent filth, washed with secretions of pus—when we consider such conditions with a celebrated surgeon about to enter into the digestive tract, can we longer question the value of the preliminary treatment by the dental nurse in such a case? Then there is the infirmary practice connected with all the large hospitals. Here is a field for the doing of the greatest good to this vast class of unfortunates. The cleansing of the mouths of properly selected patients in the dispensaries, combined with the proper education for preserving oral hygienic conditions, would be of greater value in the uplifting of the masses than any other means at present employed.

Having graduated from the training-school, it would be in keeping with our other laws to compel the nurses to pass a state board examination. The passing successfully of such an examination would then entitle them to be registered as trained dental nurses. Being so registered, they would be able to practice their profession in private life. By that is not meant the fact that they would be licensed to go around indiscriminately, cleansing the mouths of the people. Their license to practice dental nursing should mean that they are permitted to cleanse, polish, and medicate the dental territory only under the prescription of the patient's attending dentist.

It was my pleasure to introduce this subject one week ago at New Orleans before the Stomatological Section of the American Medical Association. I have practically presented to you in almost

*Since adjournment of the meeting of the society one of these bills has been signed by the governor and has now legal force in the state of New York.

the same words the views enunciated at that meeting. That these met with the unanimous approval of the men there gathered is shown by the following resolution which was unanimously passed by the Section at the last day of its session:

REPORT OF COMMITTEE TO CONSIDER CERTAIN
SUGGESTIONS IN THE ADDRESS OF THE CHAIR-
MAN, DR. M. L. RHEIN.

Your committee have carefully considered the propositions contained in the chairman's address relating to the training of women as dental nurses,—that they may, under the prescription and personal direction of the stomatologist, cleanse and sterilize the mouth, polish the teeth, make medical applications to the gums, and otherwise assist the practitioner in his treatment of patients.

Your committee heartily approves the above-named suggestions, and earnestly commends the matter for the approval of this

section of the American Medical Association, hoping that it will lead to such action being taken by different state dental societies, looking to the amendment of our dental laws, that the appointment and employment of "dental nurses" shall be legalized.

Respectfully submitted,

GEO. F. EAMES,
M. H. FLETCHER,
EUGENE S. TALBOT.

In conclusion I might say that there are three important reasons why the plan above outlined for the introduction of dental nurses should meet with your approval:

First. It will tend materially toward the public good.

Second. It will open to womankind a new vocation second to none in desirability.

Third. It will materially aid the stomatologist in the quality of his results.

NERVOCIDIN.

By THEODORE SÖDERBERG, D.D.S., Sydney, N. S. W., Australia.

AS my short article, "Notes on Nervocidin," published in the DENTAL COSMOS for November 1901, apparently has failed to arouse the interest of American and Australian dentists in this new alkaloid, and as I now more than ever before feel convinced that nervocidin is destined to occupy a permanent and prominent place in dental practice, I have thought it desirable to bring forward the subject again.

LITERATURE ON NERVOCIDIN.

In a paper entitled "History of Pulp-Capping, Pulp-Mummification, and Root-Treatment, and their Present Status," read before the Stomatologists of Budapest on the 29th September, 1900 [see *Vierteljahrsschrift für Zahnheilkunde*, October 1900], Dr. D. Dalma announced his discovery of "nervocidin," an alkaloid (hydrochlo-

rate) obtained from the bark of the *gasu-basu*, an East-Indian plant. The discovery was the outcome of a series of competitive experiments for the Herbst prize.

Dr. Dalma's announcement, although at the time accompanied by very few comments, was nevertheless of sufficient importance to induce Professor Arkövy and those on the staff of the dental and pharmacological departments of the University of Budapest to commence a series of fundamental experiments. The results were published in two articles: "Investigations into the Pharmacodynamic Effect of Nervocidin," by Professor Arkövy (*op. cit.*, April 1901), and "Preliminary Information on the Clinical Use of Nervocidin," by Drs. Madzsar and Balassa (*op. cit.*, October 1900). The following is a *résumé* of the chief points of those articles:

CHEMISTRY OF NERVOCIDIN.

Nervocidin is a yellowish, hygroscopic powder, containing N, C, H, and Cl. Its exact chemical composition has, however, not as yet been ascertained. It is very soluble in water, slightly soluble in ether and alcohol, and when moistened becomes jelly-like and very sticky. On addition of alkalis the solution becomes opaque.

A two per cent. solution painted on the eye of a rabbit produced total anesthesia of the cornea after fifteen minutes. The following day the cornea was insensitive, opaque, and bloodshot, and after forty-eight hours typical keratitis ulcerosa and conjunctivitis appeared. On the third day the eye was closed, on account of a profuse formation of pus. From the sixth day a gradual improvement took place until the twelfth day, when the cornea was clean, clear, and sensitive, and the eye normal.

EXPERIMENTS ON DOSAGE.

To determine the concentration in which nervocidin could be used for the production of local anesthesia without inflammation, decreasing strengths of the solution were next used. A $\frac{1}{2}$ per cent. solution produced hardly any inflammation; the cornea remained dull for forty-eight hours, while anesthesia lasted four days. A 2:1000 solution produced, after twenty minutes, anesthesia which lasted three days without producing inflammatory disturbances. A 1:1000 solution produced an anesthesia which lasted forty-eight hours, and no inflammation.

Two drops of a $\frac{1}{2}$:1000 solution dropped into a human eye produced a mild burning sensation and lacrymation, loss of sensitiveness after twenty minutes, and an anesthetic period of five hours. A 1:1000 solution painted on the mucous membrane and on the tip of the tongue produced local anesthesia with loss of taste; reaction to heat and cold remained normal.

To ascertain the toxic effect of nervocidin, 5 milligm. were injected subcutaneously in a rabbit weighing 900 gm.

Death ensued after two and one-half hours. In another case a rabbit weighing 1150 gm. died after twenty hours, as the result of an injection of $2\frac{1}{2}$ milligm. The symptoms were in both cases similar, viz, tremor of the extremities, muscular paralysis, paralysis of respiration, and finally cardiac arrest. With the exception of a slight hyperemia of the brain and spinal cord, no visible pathological changes could be observed. Another rabbit, weighing 1300 gm., received daily for five days an injection of 1 milligm. of nervocidin. It became quiet, but ate. On the sixth day 3 milligm. were injected. Death followed after sixteen hours. The injection of 5 milligm. of nervocidin subcutaneously into a dog weighing 8 kilogram. produced loss of appetite and drowsiness; recovery after two days. The same dog then received 1 centigm. subcutaneously at 6 P.M., and was found dead at 11 A.M. next day; dissection showed diastolic paralysis of the heart.

These experiments show, then, that nervocidin is a poison which acts by producing paralysis of the nerve-endings as well as of the nerve-centers, and that death takes place through paralysis of the motor centers, and thus indirectly through paralysis of the heart. Further, that the organism is unable through habit to withstand the normal lethal dose.

Of great interest is the singular effect of nervocidin in producing the severest keratitis ulcerosa, which appears to threaten the eye with destruction, while nevertheless all symptoms shortly disappear without a transition to panophthalmitis, yet anesthesia continues and even outlasts the keratitis.

Of great importance to the dental practitioner is, of course, the established fact that we have in nervocidin a local anesthetic which, as far as the duration of its effect is concerned, leaves all other previously known local anesthetics far behind.

So far the first fundamental experiments. The results of the clinical experiments were equally interesting. Those experiments were not undertaken

to test nervocidin as a devitalizing agent; for although in the recorded forty-four cases extirpation of the pulp was the operation in view, it was principally the anesthetic power of nervocidin in connection with that operation which was clinically tested. Its effect as a local anesthetic for hypodermic purposes, and its utility for the painless excavation of sensitive teeth, were not tested.

In the article in question, as well as in two critical articles which followed, viz, "On the Effect of Nervocidin on the Dental Pulp," by Professor Scheff, University of Vienna (*op. cit.*, April 1902), and "Observation of Teeth Treated with Nervocidin," by Dr. T. Kaas (*ibid.*, October 1902), the subject was, then, the comparative study of nervocidin and arsenic as agents for pulp-extirpation, the one anesthetizing, the other devitalizing. As all practitioners are familiar with the effects of arsenic, I shall only give the opinion of the writers on the use and effect of nervocidin.

TECHNIQUE OF APPLICATION.

Nervocidin should be sealed in the cavity with any of the various cements. If a minute quantity of the alkaloid comes in contact with the tongue and mucous membrane, temporary loss of taste and the formation of small inflammatory spots (which disappear after two days) are the results. Where it has to act through a layer of dentin, two applications are generally necessary, one for the painless opening of the pulp-chamber, another for the painless extirpation of the pulp. Owing to the sticky nature of nervocidin when moistened, the difficulty of placing it in its correct position is best overcome by moistening the under surface of a piece of spunk, then gripping the dry upper surface of the spunk with the pliers, the nervocidin is taken up, and the pellet placed *in situ*. The amount of nervocidin used is in each case the same as arsenic. If precaution as to pressure on the pulp be taken, the pain produced by nervocidin is considerably less than that produced by arsenic; it seldom gets beyond an uneasy feeling in the tooth, lasting from one-half to two

hours according to the state of the pulp. The application is best left *in situ* for from twenty-four to forty-eight hours; if allowed to remain longer than three days the tooth in some cases becomes tender to pressure; if left still longer the tenderness disappears and after a month or two the pulp returns to its original state of sensitiveness. Nervocidin brings about anemia of the pulp. The alkaloid does therefore not discolor the tooth, or only very slightly. Destruction of gum tissue through leakage cannot take place. Like arsenic, nervocidin is contra-indicated in septic pulpitis.

I shall now give the results of my own experiments with nervocidin, the use of which I commenced in June 1901. I must, however, first state that I do not now write about the effect of nervocidin *per se*, my aim being to test the accuracy of some of the statements by Arkövy, Madzsar, and Balassa concerning the effects of the pure alkaloid, and to record its effect on the pulp when used in combination with other chemicals.

What I—with all other dentists, I should think!—hankered after was an agent which would enable the operator painlessly to prepare the most sensitive cavity of a tooth without destroying the vitality of its pulp. We are fairly satisfied with arsenic as a devitalizing agent; we are fairly satisfied with cocain, eucain, and other agents as local anesthetics for extraction, etc., but who can truthfully say that he is even moderately satisfied with any of the hitherto-used remedies for that horror of all patients—sensitive dentin?

Now, the first inference which I drew after noting the recorded experiments on the eyes of rabbits, was that nervocidin probably was the desired agent; and it struck me as strange that no clinical experiments were undertaken—or at least that none were stated to have been undertaken—to permit us to draw conclusions regarding this point. I therefore soon commenced to experiment with nervocidin on the lines indicated. Care had, of course, to be observed in selecting the right class of patients, and to make certain that the teeth treated had healthy

pulps. All teeth where the extension of decay was thought likely to threaten the pulps with the inroad of micro-organisms were excluded from the list of test cases. My procedure was as follows:

Ten grains of nervocidin and ten grains of cocain hydrochlorid are dissolved in two drams of the fluid of a zinc oxysulfate preparation. Fletcher's "artificial dentin" is such a preparation, but as its exact ingredients are unknown I used my own preparation, viz:

R—Gum arabic,	3j;
Zinc sulfate,	3ss;
Water,	3j.

Dissolve the zinc sulfate in the water, then add the gum arabic, stir; let stand for twenty-four hours; strain. As powder, use uncalcined zinc oxid.

A cement is then made by mixing some of this stock fluid with the necessary amount of the powder.

The cement was placed in the previously dried cavity, where it was left for from two to forty-eight hours. A painless preparation of the cavity was the first pleasant result. The prepared cavity was next soaked for five minutes with a weak aqueous solution of ammonia to neutralize the acidity of the nervocidin; it was then dried, soaked for another five minutes with eugenol, and finally filled with gutta-percha or eugox (eugenol-zinc oxid). The teeth thus treated were examined and permanently filled after intervals ranging from a month to a year.

Of thirty-five teeth examined to date, all pulps responded to the ordinary tests for vitality and health, and in the vast majority of cases the dentin had returned to distinct sensitiveness, although not to the original state of hypersensitiveness.

AN EXCELLENT OBTUNDENT.

These results should, then, go far toward proving the accuracy of Professor Arkövy's opinion, expressed in October 1900, that it was not impossible that nervocidin would turn out to be a valuable non-devitalizing agent for the painless excavation of sensitive dentin.

I did not test the minimum time required for the anesthetic effect of nervocidin. The shortest time record I have is one and a quarter hours, that particular case being a success. Dr. Dalma states, however, that nervocidin did not come up to one of the conditions necessary to win the Herbst prize, viz, full effect after ten minutes' action.

My reason for using cocain with the nervocidin was to reduce the pain of its application to a minimum. I think that the results must be called satisfactory, as, of these test cases fully seventy-five per cent. were painless, while the remainder varied from "an annoying sensation" to "a mild toothache" lasting from half an hour to two hours.

Those dentists who have faith in the possibility of saving exposed diseased pulps will probably find in nervocidin an ideal agent for their experiments. Owing to its marvelous anesthetic power, and its anemic and non-destructive effects, it will be possible by its help to more thoroughly treat diseased pulps antiseptically than has hitherto been practicable. Nervocidin is, however, not an antiseptic.

NERVOCIDIN IN PULP-AMPUTATION.

And this brings me to the question of the use of nervocidin in connection with pulp-amputation, an operation which stands midway between the radical extirpation and the ideal conservation of the pulp, and for which I am personally an advocate. Briefly stated, the operation consists in cauterization (arsenic) or anesthetization (nervocidin) of the pulp, amputation of the coronal part, and insertion (under a permanent filling) of an antiseptic paste over the vital pulp-remnants in the root-canals, the paste mummifying the minute dead particles while conserving the live remnants. This is, theoretically, the process; but, practically, we often find that arsenic penetrates deeper than we wish, and instead of a cauterization of the coronal parts only, we often find an almost total devitalization, which for safety's sake necessitates amputation of the root-pulp close to the foramen, in consequence of which

the strong paste is liable to cause irritation in the apical region.

It would therefore doubtless be an advantage to use nervocidin instead of arsenic in all cases of pulp-amputation, a further point in favor of the former being its production of local anemia. A disadvantage—when time is a consideration—is the necessity for two applications of nervocidin when a thick layer of dentin has to be penetrated.

Whether amputation or extirpation be resorted to, I cannot too strongly recommend the use of nervocidin instead of arsenic for the incisors, canines, and first bicuspid. The unsightly discoloration of the visible teeth frequently resulting after pulp-devitalization with arsenic ought—now that we have nervocidin—to be a thing of the past.

There remains to be mentioned the combination of nervocidin and arsenic. I use arsenii sulphidum citrinum (Merck), q. s., together with equal parts of nervocidin and cocain, taking up the three parts on the spunk in the order mentioned. The results are very satisfactory, and I wish to recommend this combination where an arsenical application is required.

The question naturally arises: If, according to Arkövy's experiments, two drops of a $\frac{1}{2}$:1000 solution of nervocidin suffice to produce five hours' anesthesia of the cornea of a human eye, without any inflammatory symptoms arising, could not nervocidin in correspondingly weak solution be successfully used hypodermically for extractions, etc.? Taking the experiments on the dog as a base of

calculation, a comparatively safe (non-toxic) dose for injection into the human gum would be five drops of a one per cent. solution. This would, however, probably cause considerable inflammation and pain. I have experimentally injected three drops of a 1:1000 solution of nervocidin into my gum and the same quantity into my arm. No inflammation took place; but the local anesthesia was very weak and its area very small. A pricking pain lasted about half an hour. It appears to me that the indications to the future use of nervocidin as a local anesthetic in the hypodermic form are unfavorable. It is, however, to be hoped that an antidote to nervocidin will soon be found, which will permit the undertaking of further experiments in this direction.

Nervocidin is put up in bottles containing one gram (price, ten marks). The powder being hygroscopic, the original bottle ought to be kept well sealed after transferring a small quantity to a vial having a waxed cork. Should, in spite of these precautions, the powder become lumpy, it can be dried and powdered again, care being taken that particles do not come in contact with eyes and nostrils.

I sincerely hope that the recorded experiments will be the means of inducing American and Australian dentists to devote some attention to the valuable alkaloid which Dr. Dalma's discovery has added to our materia medica. I feel confident that nervocidin will then be as highly appreciated by the profession as it is sure to be by the public.

PROCEEDINGS OF SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, March 1903.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, March 17, 1903, at the New York Academy of Medicine, No. 17 West Forty-third street, New York city, with the president, Dr. Hodson, in the chair.

The secretary read the minutes of the last meeting, which, after slight correction, were approved.

Dr. JARVIE. It is my sad duty to announce the death of Dr. W. A. Campbell of Brooklyn, who died this morning. He was perhaps better known among those who reside and practice in Brooklyn than to the members of the profession in New York. He was one of our old practitioners, although he had the appearance of a comparatively young man. He was a good fellow and a good dentist, and I move the appointment of a committee to prepare a minute upon his death, to be reported at the next meeting.

The president appointed as such committee, Drs. Jarvie, F. C. Walker, and S. G. Perry.

INCIDENTS OF OFFICE PRACTICE.

Dr. S. L. GOLDSMITH. I desire advice in the case of a patient about thirty years of age, who presented with an upper temporary canine containing a large cavity, with almost an exposure of the pulp. Would you fill that with a permanent filling? If it ached, would you remove the pulp? What would you do with it? I shall probably have an X ray taken to see whether the permanent tooth is in the maxilla at all. But supposing there is no permanent canine there?

Dr. W. W. WALKER. If I had it, and it were as nearly exposed as that, I would devitalize it.

Dr. GOLDSMITH. A gentleman here says that he has lost nearly every one he has tried. I put in an oxyphosphate filling to-day and it was comfortable. I forgot to say there had been a gold filling there which had failed.

The PRESIDENT. What would be the object of putting in a gold filling?

Dr. JARVIE. If you want to save the pulp alive, why not use gutta-percha?

The PRESIDENT. I think the walls and the floor of the cavity could be so treated that the oxyphosphate would not devitalize it.

Dr. GOLDSMITH. Yes; the floor of the cavity could be varnished.

Dr. JARVIE. The gentleman was fearful of the condition of the pulp. I think, therefore, it would have been safer to have used the gutta-percha. If there were no question in his mind, he could have used the oxyphosphate filling; but while that question was in his mind, I think the gutta-percha would have been safer.

The PRESIDENT. You mean, the doubt being in his mind he put in the oxyphosphate without any preparation.

Dr. JARVIE. I did not say anything about the preparation. I merely say I think the gutta-percha would have been safer. Of course, there is a great deal of conjecture in discussing a question of this kind, because we do not know whether the permanent canine is in place, nor do we know the length of the root of this temporary canine. The X ray will determine that. Possibly the appearance of the alveolus—its fulness or lack of fulness—would determine to a great extent whether the permanent canine was in the maxilla or not.

Some ten years ago a patient of mine presented herself with the temporary canine decayed away, leaving just the root, and there was every indication that there was no permanent canine in the vicinity. I trimmed off the root and put in a lateral incisor, because the space was altogether too small for a canine-shaped tooth. I shaped the lateral as well as I could to appear like a small canine. I have seen that tooth within a month and it is still doing good service. How long it will last, I cannot tell. The lady is now about thirty-five years old.

Dr. GOLDSMITH. What would Dr. Jarvie do, if the X ray should reveal a canine in the vicinity?

Dr. JARVIE. If it were in the vicinity and the appearance would indicate that the extraction of the temporary canine would reveal the permanent one near the socket, I should be inclined to extract the temporary canine, cut away what little process might intervene between the socket of that tooth and the permanent canine, and expect that the irritation would start a downward movement of the latter. I had a case, a couple of years ago, of a lady about twenty-two years of age at that time. I had an X-ray picture taken and the permanent canine was revealed near by. I extracted the temporary canine, cut away the intervening process, and the tooth is coming down slowly. It is about half-way down from the margin of the gum to where the cutting edge should be.

Dr. GOLDSMITH. Was the root of the permanent canine fully formed?

Dr. JARVIE. I do not know that I can answer that question positively, but the impression left on my mind is that it was formed. It was simply a non-erupted tooth.

Dr. GAYLORD, New Haven. Would you under any circumstances feel yourself warranted in withdrawing the attachment to the process, to get the tooth to come down gradually?

Dr. JARVIE. Yes; I have done it in some cases, but I did not in this case, because I did not want to drill. This tooth will, I judge, be down in place within

twelve months. It will take that length of time before it erupts.

Dr. GEO. W. WELD. I have a very interesting case here. It touches more or less upon the subject of the hardness and softness of the enamel. The patient is fifty-three years of age. He has thirty-two teeth in his mouth; he has, of course, never had a permanent tooth extracted, and he has never had a tooth filled. There is no mechanical abrasion to speak of, excepting on the buccal sides of the molars, and there is no chemical abrasion in any way. His gums are in a healthy condition, and the fluids of the mouth, so far as I can judge, are also healthy and the environment is good. What is there in the composition of the enamel of those teeth which has enabled them to resist the influence of decay for a period of forty-seven years? What is the composition of the enamel—what is the composition of the interprismatic substances? Is it the thickness of the enamel, the environment, or what is it that has enabled those teeth to resist the encroachment of decay so long? The gentleman is a club man, and smokes and drinks, although not to excess; he is a man about town.

Dr. PERRY. I think it is the environment.

I also have something to present under "incidents of office practice." Here is a case of two teeth standing together, one of which may be a temporary tooth, or it may be supernumerary. I sent the patient to Dr. Van Woert, and he sent me back this X-ray picture, which in his judgment discloses a supernumerary standing by the side of the usual tooth. I show that cast and picture to ask the question, Which one of those teeth should be extracted? I saw the patient last spring, and one of those seeming laterals had just come down, which in my hasty examination I supposed was the "eye-tooth" coming. It was very late in the season and I did not like to commence. The patient is about twelve years of age. When she came back in the autumn, I found this condition.

Professor C. A. BRACKETT, of New-

port, R. I., then delivered the following address:

SOME THINGS WHICH WE NEED.

I have seldom got upon my feet to speak under circumstances of such embarrassment as those which accompany my appearance before you this evening. Many months ago I had a letter from your president suggesting that I give a paper at some meeting of this body. I did not reply immediately, because I could not see how I could well give anything that would be of profit. I cherished the hope that he had forgotten the matter, until I came here to the most excellent meeting which this society held in January last, and by which I was greatly benefited. From that meeting I carried away more in the way of helpful suggestions, more in the matter of gained knowledge, than from any meeting I ever attended in my life. At that time the Executive Committee besought me again to appear before you, and I reluctantly consented to try to occupy a little place that had been made vacant in the proceedings of the year, but with the unnecessary declaration (and altogether unnecessary for me to repeat here) that there is no subject, theoretical or practical, to which the members of the Odontological Society give attention, or upon which they would like to hear discussion, in which they are not more proficient than I am.

I said to the members of the committee, "I am not an original investigator; I am not a profound student; I have absolutely nothing whatever that I can bring that will be profitable for the members to listen to,"—and yet I am here. I am here out of my appreciation of the kindness and affection that has been perpetually manifested toward me from the time I was first surprised by being made a member of this association, more than a quarter of a century ago. It is my heart that brings me here, and not my head; it is my affection and not my capacity for teaching that brings me before you. I shall try to make such declarations and indulge in such repetitions of truisms as you can indorse,

asking as others have done for help and advice, and to state to you some of the perplexities that exist in the minds of all of us.

The subject which I have chosen is a very large one. In my boyhood we used to have this conundrum, "What is the largest room in the world?" and the answer was, "The room for improvement!" So a discussion of some topics under the head of "things we need" is perhaps not inappropriate. I have come without any manuscript—come with the idea of talking to you and with you—encouraged to do so partly as a matter of my own convenience and partly by the suggestion of one of my friends, who intimated that my written papers were worse than my talks!

If we went back to the dental profession as it existed at the time of the organization of this society, we should see a condition of affairs different from that which exists now. A different order of things obtains in the case of everything which men make an object of study or with reference to everything which they practice as an art. People say to me sometimes, "Dentistry has made great strides in recent years." I say, "Yes, dentistry has; if it had not, it would not have kept up with the rest of the procession."

Let us take a brief thought as to what has been accomplished in general medicine and in surgery, especially in the matter of antiseptics and asepsis and the undertaking and successful accomplishment by the average practitioner, not only in the hospitals of large cities but in country places, of operations that would have been declared absolutely unjustifiable in the practice of a generation or two ago. The operations which dentists are performing—the ordinary practitioner, we will say—as a mere matter of routine to-day, with the added facilities and better understanding of principles and methods, are quite as much in advance as are the achievements in any other line of human effort. I think the history of our profession is a brilliant one. It is a young profession which has existed for but a limited time. It has

built up, very largely within the last third of a century, a literature, a periodical literature, a literature of text-books, and it has also adapted and adopted principles of practice most intelligent and wise.

Investigators who have been dentists have done great service to the world in discovering and making generally known some of the most important and helpful truths that have ever been added to the stock of human knowledge. In recent times nothing has been studied more profitably than bacteriology, and especially that part of bacteriology which has to do with the etiology of disease. In that field the work of our Dr. W. D. Miller rightly has an honored place. His studies concerning the causative influences of dental caries have put clearness in the place of obscurity, and positive demonstration in the place of uncertainty.

But of all discoveries which have ever been made for the relief of suffering humanity, the discovery of anesthesia and anesthetics must have pre-eminent place. In this discovery and its promulgation Horace Wells did the work of the pioneer, and William T. G. Morton, another dentist, stands forth prominent in the little group of men who contributed by research and demonstration to this inestimable benefaction.

Our specialists have developed other points of origination in the matter of discovery and application, from which general practitioners, both medical and surgical, have learned much. We have to confess that we also have learned a great deal from those who are practitioners of the healing art in a general way. We have built up for the training of dentists educational institutions to which many of our ablest practitioners give a good deal of their time and effort. We have very greatly added to the requirements of those institutions, so that a course of study there, and the curriculum pursued, are much extended from what they were—multiplied several times over beyond that which was afforded in the student days of the older members of the profession.

With a brief glance at the past and the

condition of things as they exist to-day, we have never been more appreciative of the desirability of improvement in the future than we are at the present time. We never felt our own ignorance more; we never felt our own incapacity more; we never have been more conscious of the truth of the doctrine which Bacon has expressed, to the effect that things which are not made better designedly, tend to grow worse spontaneously. This is true with us as individual practitioners, and as a profession, in what we are to accomplish in the world.

Now for reference to some matters of detail in practice. There are very many things which daily—almost hourly—we realize that we need, and to which it would be quite unnecessary to make any reference. We all know and say to our patients that our filling materials are not at all the ideal thing. Dentistry is too laborious for the dentist and too expensive for those who need to have it done. It is too time-consuming; it does not accomplish all we would like. We need a filling material that may be placed in the cavity as easily as so much wax or putty, that shall counterfeit the natural appearance of the tooth, and that shall be durable.

We should have such hygienic and prophylactic conditions that caries should not occur. We would like to have such control over the influences that lead to decay, and over disintegration of tooth-substance that there would be no occasion for this great amount of restoration and repairing of the ravages of dental decay.

We would like to so contrive the diet, the chemistry, and the mechanics of every mouth that there should be a perpetual condition of health, and not the need of this constant ministration. These matters are so palpable and so prominent, and moreover are so beyond our present capacity of attainment, that I only make this brief mention of them.

There are one or two matters of principle with reference to our practice that I would like to mention. It is the disposition of humanity to do a good deal of grumbling with circumstances as they exist. We grumble over the situations

in which we are placed. We grumble over our own individual trials and troubles; we grumble over the weather; we mourn over the percentage of failures; and do all this perhaps more unthinkingly than we should do. We should start out with a different viewpoint, and realize that in the succession of days and years there must be a certain number of rainy days, and make up our minds to be just as comfortable and happy, indoors or outdoors, whether the sun shines or there are clouds in the sky. We should realize that in the practice of every man there are presented problems difficult of solution—perplexities and trials and difficulties of management—and accept them as nearly as possible in the same spirit with which we accept the easy and pleasant things, and do the best we can under the circumstances. I think we may gain a practical point by setting our problems before ourselves in our own minds just as they are, instead of dwelling on a theory or a condition which does not exist. It is rather a natural disposition or expression to say, "If things were so-and-so, then I would do so-and-so." That is dodging the issue. Stating a question in that way, "If the circumstances were different from those which obtain, I would do so-and-so," is not a fair statement of the problem. We may say, "If this cavity were not so sensitive—if the cavity were not so far under the gum—if the patient were more tractable—if I had more time—I would do differently"; but we should say to ourselves, "Things *are* so-and-so; now what am I going to do?"

This viewpoint will enable us to go on with the difficult and perplexing things with a good deal less fret and worry, and with far better self-control, co-ordination, discretion, and judgment for those who receive our work, than if we stated the question in the other way.

In my student days, one of your honored ex-presidents was a lecturer in the Harvard Dental School, and, in one of his talks before the class of which I was a member he used an expression which has come back to my mind over and over again, one which I have repeated to sub-

sequent classes, and which has been most helpful to me. The expression was this: "When you have something especially difficult to do, first make it easy." He did not mean by that any shirking of responsibility, or any temporizing, or any following of any plan whatever except doing the best thing which human ingenuity and earnestness could devise for the treatment of that case. In the sense in which he did intend it—of first making easy that which at a superficial view appears difficult, by a careful study, by the exercise of an ingenuity, very often an originality, to meet the conditions—that teaching has been most helpful to me.

Another expression of the same gentleman has been quoted before you within recent months by an essayist. It was in reference to the treatment of cases of irregularity: "Do a thing; don't do at it." I think that is also a very helpful, practical, profitable suggestion.

I speak in detail of one thing which I especially wish as a matter of practice, which I have sought to find for years, but which I have not found, and which doubtless almost any one of the gentlemen present can immediately suggest to me—that is, a means of retaining a medicament in a cavity temporarily, a means that shall be positive in its sealing qualities, reliable in every way, and easily removed: I would like a white cement, with which I may seal in a tooth an application of arsenous acid and know that there will be no leakage, and which, when I wish to remove it, can be very easily and readily cut away because it would be a soft material very easily removed. I have presented the problem to various makers and dealers in cements, and have met, of course, the practical expression, if not the theoretical one, that they aimed to produce in their cements the qualities of hardness, durability, and difficulty of removal.

For some time I met this want with some deteriorated cements that had been long kept in the office; but those have been exhausted, and this is one of the expressions of need which I bring to you,

trusting implicitly that it can be answered.

I have also two suggestions to make, and they may not be new to most of those in the room. One is a testimony in reference to the great satisfaction I have had with a certain agent in controlling bleeding—slight bleeding as experienced in the preparation of a cavity at the neck of a tooth, or profuse and alarming bleeding following tooth-extraction—or exudations of the gum of any sort, but more especially bleeding. The agent with which I have had this satisfaction is adrenalin chlorid. It is free from every objection. It is in no way unpleasant to the taste, in no way escharotic, with no after-effects, with not the slightest disagreeable or unfavorable circumstance in any particular which I have yet been able to find. The agents we have used before, the old agents such as iron perchlorid and the more recent trichloroacetic acid, produced a very undesirable escharotic effect. They were very disagreeable and uncomfortable to the patient often for days afterward, and some of them left a possibility of the recurrence of the bleeding. Nothing, as far as my observation goes can surpass the trichloroacetic acid in the positiveness of its effect. In some instances I make some use of it now, but not frequently, on account of its escharotic quality, from which the other medicament is entirely free.

I had recently, following the extraction of a third molar, a case of profuse bleeding which was readily controlled with the adrenalin chlorid with some pressure, and when the bleeding stopped, the gum in the vicinity was blanched from the application. It had an exsanguinated appearance like that produced by an injection which has been forced into it with the hypodermic syringe.

We should not be too much afraid of doing unorthodox things. We should not be too fearful of doing something which is out of the ordinary routine of practice. I mean we should consider the needs of cases as they are presented to us, seek to get a grasp of what is needed in each case, and then apply something

that will meet the needs, even if it be not in accord with the usual procedure. The thing that stimulated me to make this suggestion was something which I have lately done which to me was new, and which has pleased both the patient and myself very much. A lady had several vacancies in the lower jaw. The remaining teeth stood at very different angles, and they had large crowns and narrow necks. All the molars of the right side of the lower jaw, the lower left first and second molars, and two lower incisors had been lost. The lower left third molar was inclined forward at an angle of about forty-five degrees, and the antagonism was peculiar. I had made successive efforts to contrive something in the way of a partial plate to fill all the vacancies, which I could put into place after it was made and which could be worn. In every instance I experienced only a failure. Finally I made for the space on the left side of the jaw something which would fill that space and which could be pushed into position from the tongue side. I filled that space with an independent fixture. Then the other vacancies in the front and in the right side of the mouth I filled with another fixture which was given stability by a clasp around the lower right second bicuspid; the left end of this appliance so rested against the appliance first put in that it held it in place. To state the idea in general terms, it would be to construct fixtures for filling vacancies, in cases where it is hard to put them in in one piece, in two or more pieces, and make the last piece a practical keystone in the arch to hold firmly in its place everything previously constructed.

One topic of which I wish to speak is the matter of dental education. We have needs in this particular; we have ideals in this matter, and we have perplexities; about all that can be mentioned in this connection are some of our perplexities. As a starting-point, there is a commendable and growing disposition to make the entrance examination for the dental schools higher and higher. In my own student days there was no such thing as an entrance exam-

ination. That came years subsequently. At the beginning the schools had to be very moderate in their requirements. With passing years it has been found practicable, as well as desirable, to very considerably raise the standards. The best medical schools have already made as a requirement for admission the possession of a degree in letters, arts, science, or philosophy. It is desirable that dental schools should get as near that standard as they can. It is desirable that the course of instruction in the school be longer than it is now. While the average young dentist, when he leaves the institution where he has studied, is better fitted for his practical work than is the average young man in almost any other calling, he is not so well fitted as the schools would like him to be, or as he would like to be himself. The Association of Dental Faculties has established a rule that in future the course of study in dental schools shall be four years instead of three years. In the different schools the school year varies in length from five, six, or seven to nine months. Four of the longest years would not make a young man any too proficient in the practice of dentistry, but the equitable adjustment of the whole matter seems a thing of some difficulty.

Then it is very desirable that a practitioner of dentistry should be a practitioner of a specialty in medicine; and there is the suggestion logically made that dental schools and dental degrees should be abolished, and that a practitioner of dentistry should be like the practitioner who deals particularly with any other organ or region—with the eye, the throat, or the digestive apparatus—holding the degree of M.D., having in a large measure the culture of the general practitioner, and having in addition the special culture of the dental practitioner. All these circumstances, put together, would make it so that a man must be approaching middle age before he could begin practical work in the world.

Out of all these things something must come. There must be a solution of these problems which in time will come. If I made a statement in this connection as

to what we need, it would be that we need wisdom and discretion to choose out of all the desirable things those which are most essential—to get as much as we can, and leave out as little as possible.

Many of those who have been teachers in dental schools have hesitated very much about accepting the idea of a medical education for the dentist, on account of a fear that it will lessen the amount of practical study with reference to our specialty itself—the fear that in this modified course of education something of manual practice and manipulative dexterity would be lost; and manual dexterity, notwithstanding all that we may get from a grasp of general principles and general medicine, is a very considerable portion of the foundation upon which has been built the deservedly high reputation of the American practitioners of dentistry in the past and the present.

Now another matter of education, and one which it seems to me is of very great practical importance with reference to the advancement of the profession: We had before us in January an illustration of what may be done in the way of accomplishing certain results, by men who have a general practical and professional education, time, and devotion, in that which Dr. Kirk gave us with reference to the arrangement of the calcium salts in different teeth—teeth presenting differences in the matter of hardness and resistive capacity to influences of decay,—a typical illustration of what may be accomplished in original investigation. In this direction, it seems to me, it would be a matter of the utmost desirability for the profession to sustain a few men who have this taste and capacity for original investigation, in order that we may gain new truths such as Dr. Kirk and Dr. Black and Dr. J. Leon Williams have presented and as—perhaps more than any other one man—Dr. Miller has presented. Because these men have earnestly studied in these fields and given their time and energy and devotion to the attainment of these things, we are all wiser and better practitioners; and it has been a great deal better for us all

that a few men should have attained those great things, than it would have been if many of us, good practitioners but less capable as investigators, had tried to do all we could toward the same ends: this with reference to what we all deem, I believe, the truest economy of effort.

Another point is in the needed education of the public with reference to the value of the teeth, and an appreciation of that which dentistry can accomplish. Speaking now with reference to general conditions, it is to be regretted that in humanity as a whole there still remains so much need of a better education in practical things and a better understanding of foundation principles. With a few exceptions, and those only recently, this country has always held its doors open wide for the free incoming of all sorts and conditions of men. With little preparation or regard for their fitness we have rapidly pushed them forward to make them naturalized citizens, and we have given them a voice in the management of our affairs. And now in the industrial world, for instance, things are going markedly wrong, largely on account of popular ignorance, very largely because there is not even ordinary common-school education, to say nothing of any grasp whatever of the principles of social or political economy, or what are the right and just relations of labor and capital.

Whether this country in self-defense may ever modify its regulations with reference to immigration or the exercise of the suffrage, is one of the things for future decision; but it is certainly made plainly apparent in the industrial world, and has been especially so in the past year, that a condition of ignorance prevails which is most deplorable. And this is typical of a condition that exists with reference to the work of our own specialty, a condition which is realized and which we are seeking to ameliorate. We are trying to use such efforts as we can to accomplish a reform in that direction.

Intimately connected with that is the matter of gratuitous service, or service

for a nominal expense, for those who have knowledge and appreciation, but not the material means to have much conserving dental attention. This is comparatively a new problem which has been brought to our attention very especially within the last year. It has been made a matter of discussion within a dental society, and has been taken up by hospitals and other institutions which are offering help to those who are in need. What can hospitals do in the line of practically gratuitous dental services? What can the profession do in the way of maintaining dental clinics and infirmaries where something more than the extraction of aching teeth is accomplished? Here is the statement of a need or problem which without doubt future years will solve.

I have been very much gratified that this metropolis has already done probably more than any other locality in the way of instituting dental service in hospitals and giving dental treatment upon a broader plan than had been attempted previously. This will doubtless accomplish very much.

There is this encouragement with reference to it, that as the country grows older, as institutions have had a longer existence, as wealth accumulates and endowments increase, the means of accomplishing these things will very naturally accrue. The endowments of hospitals and charitable institutions of every sort inevitably grow in the lifetime of passing generations. This is one of the cheery reflections with reference to this problem.

Another point is the matter of legislation regulating the practice of dentistry. We have practically accomplished everywhere, in all the states throughout the length and breadth of the land, legislation purporting to regulate the practice of dentistry. This has already done a great deal in restricting and prohibiting the work of irregular and incompetent practitioners; but it has probably accomplished more in its indirect moral influence in leading all right-minded young men to come into the profession through the right door and make themselves hon-

orable, worthy practitioners of dentistry. The laws are not uniform in different states, and in some instances it is likely that there are hardships and inconsistencies. Probably there are points in the laws which have not yet been sustained; probably there are weak places; and I suppose it is with a view to first strengthening these weak places that not so much has been done in some states in the matter of strict enforcement of the laws as will be done later. Notwithstanding the presence of the law on the statute-books, there are states and localities, especially in large cities, where the irregular practice of dentistry is carried on without concealment, just as there is the illegal sale of liquor, and the presence of other objectionable and law-breaking concerns. It seems to me very desirable that this condition of things should be set aside as quickly and as radically as possible. The longer the irregular practice of dentistry is permitted, the more difficult it will be to stop it. I can understand no other good reason for delay in proceeding against irregular practitioners than a desire to get a more invulnerable legislation and capacity of execution as a foundation for such procedures. The evil as it exists is a very material one, and I believe earnest efforts should be made for its abolition.

Out of nine years' service which I had as president of the Board of Registration in Dentistry in Rhode Island perhaps the one thing which I had impressed upon me most, as a point learned out of experience, was that in procedures by any board of registration, whatever its title may be, it is very desirable to go strictly in accord with the best procedure—in other words, very desirable before making any movement to do it under the advice of a competent lawyer. There should be, as a guide to procedures that are taken, competent legal advice, in order that mistakes may be avoided and that failure may not result.

I realize that I have spoken at considerable length, and will detain you further only a little to say that I believe one of the things which we especially need is that we should be not only den-

tists, but useful citizens as well. Professional men who have had some advantages and whose homes are in communities of moderate size, have not only opportunities but calls and demands to be of service in various capacities other than as practitioners of dentistry. It seems to me that these should be accepted as a summons to honorable duty, and that that man who makes himself not only a practitioner of a profession but a useful public-spirited citizen as well, is filling a larger and better place in the world than a man who simply confines himself to the one thing. In doing that we not only elevate ourselves, but we add to the esteem in which the profession is held.

Real-estate men say that no man can improve his own property without contributing to the value of his neighbors' property; whoever erects good buildings and maintains neatly kept surroundings adds to the attractiveness and value of other property in the street or in the neighborhood. Similar doctrine applies to us as individuals, as dentists and as men.

I thank you especially for the kindness which you have always extended to me through all the years that are past upon every occasion when it has been my good fortune to meet with you, and most especially for the tolerance which you have given to this talk, which, although it has extended over so much time, has really comprehended so very little.

The PRESIDENT. This superb lecture is now before us for discussion.

Discussion.

Dr. JARVIE. It is always a delight to listen to our old friend Dr. Brackett, and to-night he has given us a very entertaining and instructive talk. He has gone over much ground, and touched upon many points. I will refer to but two of them and leave others to take up the rest.

Dr. Brackett spoke of the investigations to which we should direct our attention, looking toward the prevention of decay. I could not help but couple that remark with this model that was

brought here by Dr. Weld, and his question, "Why should these teeth at the age of fifty-three years show a condition perfectly free from decay, while other sets of teeth, apparently as well formed and in the mouths of as healthy people, present with many cavities in them?" Dr. Weld asked whether it was the thickness of the enamel, the environment, or what it was? Dr. Perry answered that the enamel had nothing to do with the case; that it was the environment. I think Dr. Perry was right. It *was* the environment, the freedom from fermentation or the products of fermentation, and I believe the future of dentistry will comprise very largely methods for the prevention of decay rather than the treatment of decay that has already taken place. To do that we must extend the present field of education so that those coming into the profession will be better able to conduct investigations in this direction. I believe that is to be the true field of dentistry in the future. If we can so prevent the fermentation in the mouth, and so arrange the environment that mouths will be free from the acid formed by the bacteria, we will have no decay.

Another point that Dr. Brackett referred to was the matter of dental education—education in the dental schools in connection with that of medicine. A more thorough education in some of the theoretical branches relating to dentistry, such as chemistry, bacteriology, and branches of that character, for dental students, would produce men better equipped to conduct what I believe will be the future practice of dentistry. Some of the educational institutions of the country are already arranging courses of a character that can be followed in universities rather than in dental schools pure and simple—a course in which the branches of dentistry and medicine are identical. For instance, the lectures in anatomy, physiology, pathology, chemistry, bacteriology, etc., should be identical in both branches, so that the man who is studying dentistry may receive exactly the same instruction by the same instructors in those studies as those who

are pursuing a medical course. In that way the student can go through a complete course of medicine and dentistry in five years. If that can be carried out to a successful termination, and it seems quite practicable, it would appear as though that were one of the desirable directions in which dental instruction should go.

There are many other points upon which I might touch, but the hour is late and there are others to speak.

Dr. PERRY. It is not possible to say anything about this address except to commend it from the first sentence to the closing one. It is a genuine New England output; it is as native and natural as can be; it is as refreshing as the wind that blows over New Hampshire and Vermont. It is not surprising that the world at large should admit the fact to-day that for one hundred years past there has been no region or section on earth to be compared with New England. And why? Italy for art, Germany for sincerity and honesty, France for delicacy and refinement in the application of the fine arts, England for a bluff, sturdy manhood, and New England for common sense. If this address to-night was not the boiling down of common sense, put into English, then I don't know what it means. It is optimistic to the last degree, although perhaps Dr. Brackett would not make such a claim. It is full of New England helpfulness. I have said sometimes that I thought Dr. Brackett was an embodied conscience, and so he is. He has the rare quality of seeing things as they are from an elevated standpoint, without regard to theory or "isms." He is sound and wholesome, every inch of him, and I love him as a brother and a man.

Dr. WELD. I am prompted to say just one word in reference to one or two suggestions which Dr. Brackett made with regard to special study of the arrangement of the calcium salts in teeth. I recall that some twenty years ago Dr. Carl Heitzmann organized a class in microscopy. One or two here to-night were members of that class. Dr. Atkinson was a member, Dr. Bödecker, and a

number of others that I might mention. One evening Dr. Heitzmann was lecturing upon the enamel and the enamel rods, their composition and decomposition into prismatic substances, and he separated them. The technique at that time was to place a tooth in a weak solution of acid for a period of one or two months and then with a sharp razor take off a thin slice and place it under the microscope. The enamel rods were then separated. I said to Professor Heitzmann that evening, when I had a very thin section of enamel which had been ground under water, that I wished to show him something. I placed it under the microscope, and after the focus was properly arranged, I teased through by absorbent paper a six per cent. solution of acetic acid. In ten seconds all the interprismatic substance had been dissolved, and the enamel rods had been swept to one side, as we see driftwood upon the bank of a river after a flood. By a singular coincidence, a six per cent. solution of acetic acid will dissolve the calcium carbonate but will have no material effect, for the time being at least, upon the calcium phosphate, and the query was raised at that time whether, after all, the interprismatic substance was not composed of the carbonate, and the enamel of the phosphate. There are certain prisms cemented together by the calcium salts, and it was thought perhaps it might be so in the case of the teeth. Be that as it may, the fact remains that the susceptibility of the interprismatic substance and the enamel rods respectively correspond almost exactly to the carbonate and the phosphate of calcium. I simply mention this in connection with Dr. Brackett's suggestion in reference to the special study of the arrangement of the calcium salts of the teeth.

Dr. RHEIN. I can only echo the sentiments of those who have preceded me, in stating my pleasure at listening to the masterly address of Dr. Brackett. He has carefully covered what might be considered the entire ground of the matter, and I question if a single auditor

could take exception to any statement that he made.

Dr. Perry spoke of Dr. Brackett's remarks as being optimistic, and I certainly have taken them in the same vein. I believe it to be our duty—and as I grow older that idea is more and more forced upon me—to be optimistic. I hope I shall remain optimistic to the last moment. Dr. Brackett has spoken of many things that we all feel we need. I want to add to what he has stated just this: It is impossible for us to attain any of those points in a moment. No one realizes that more than Dr. Brackett himself. It is the gradual evolution or progress we have made alongside of general progress that leads to improvement, and it is in reference to that progress in one individual direction of which he spoke that I wish to add a word, although it has already been spoken of by preceding speakers—that is, the general question of prophylaxis—getting the mouths of the public at large in such a condition that there will be less need for dental work. There is no subject in dentistry or anywhere else that has been dearer to my heart for the past twenty years than this question of prophylaxis. It appears strange to me that it should be the one subject to which the profession as a whole has been deaf. It seems to have lain dormant with the profession. As long as nineteen years ago I endeavored to arouse a passing interest in this matter, and also at various times since, and I believe the time is almost ripe when the profession in the United States is ready to take hold of this subject in a practical manner.

To sum the matter up, in the same line of common-sense talk that we have listened to this evening, do we do the greatest good for our patients when we conduct a family practice on lines that are simply remedial and not preventive? I, for one, claim that we do not. I believe that the effort to instruct our patients how to prevent troubles of the mouth, how to keep the environment of the mouth in a healthy condition, is of more practical value than the practice of strictly operative dentistry. The

practical elucidation of this matter is another thing. No busy practitioner of dentistry—in a crowded city, at any rate—has the time personally to devote to this topic, and the neglect of it is not because of the ignorance of the profession, but because of a practical inability to cope with it. I do not want to take up any more time this evening, except to say that I have been giving a great deal of thought to this subject, and I expect to go more fully into it at the meeting of our State Society in May. I hope there to present to the society what may be a practical method for handling what I consider the crying need of the profession and of the world at large. I think that there should come from American dentistry a scheme by which the teeth of the human race can be better preserved in the future than in the past. I do not expect in the little paper I will present there to outline a plan that should be strictly followed, but I shall try merely to lay the foundation for what I believe the profession is ripe for. I mention it in this way because it is so much in accord with the sentiment not only of Dr. Brackett, but also of all those who have discussed this paper.

Dr. GILLET. As many of you know, it has been my good fortune during my entire professional life to be in close touch with Dr. Brackett, first as a student, then as his assistant, later as his associate, and still later as his neighbor; and when Dr. Brackett addresses any society

the thought always comes to me that I know of no man who puts so much of his everyday life into his talks as Dr. Brackett does. He is one who practices what he preaches, and what he has been telling us to-night is just the way he lives every day in the year and every year of his life. It is a great pleasure to have him talk to us.

Dr. BRACKETT. When we were together not very long ago, there was some reference made to the discipline of the gentleman here at my left. Some question was asked as to whether any of his children ever did anything that was not quite right, and he said he would not claim that his children were more perfect than other children. The next question asked was, "Well, when they do not do quite right, what do you do to them?" The answer was, "I just sit down and put them on my knee and hug them and hug them and hug them." From my past experience with this society I had cherished the hope that they would deal leniently with me in the way of shortcomings. I must confess that out of the magnanimity of this society I expected to be forgiven, but I did not expect to be forgiven so much. I am very appreciative of your kindness.

A hearty vote of thanks was offered to Dr. Brackett.

Adjournment.

ELLISON HILLYER, D.D.S.,
Editor N. Y. Odont. Soc.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

Monthly Meeting, December 1902.

THE First District Dental Society of the State of New York held a regular monthly meeting on the evening of December 9, 1902, at the New York Academy of Medicine, 17 West Forty-third street; the president, Dr. Chas. A. DuBois, in the chair.

The subject of the evening consisted of a continuation of the discussion at the last meeting (see July Cosmos, page 553) on the paper by Dr. E. A. Bogue, "Why I Treat the First Permanent Molar with Respect."

Discussion.

Dr. WILLIAM CARR. At the close of the last meeting the opinion seemed to prevail that Dr. Bogue would not under any circumstances extract a tooth or roots. Dr. Shields cited a case that occurred in his practice in which the roots of the upper first molar were involved, and he asked Dr. Bogue how he would treat this case. I must confess that I do not yet know where Dr. Bogue stands on that question. As I understand the case described by Dr. Shields, I do not hesitate to say that the roots should have been extracted.

If a patient calls upon me for treatment and I find that the first molars have exposed pulps or necrotic roots, or chronic abscesses, or *any* pathologic condition, and especially if the teeth are crowded, I should order the removal of such teeth. I believe that we all try to save as many teeth as we possibly can; but I cannot in every case save thirty-two teeth, and carry a patient to the age of fifty or sixty years with a perfectly healthy condition of the mouth. There are mouths containing thirty-two healthy teeth, but they are the exceptions. Unlike Dr. Bogue, we cannot always select our patients, but we treat cases as pre-

sented. Dr. Bogue reminds me of a physician who claimed never to have lost a patient with measles or with scarlet fever. It was found that whenever he had a case of either of these diseases that threatened fatal results, he was invariably "called out of the city," leaving a brother practitioner in charge until the decisive point was reached. Then he could truthfully say that he had never lost a case of either measles or scarlet fever. We who have practiced for twenty-five or thirty years find that we are sometimes obliged to extract some of the first molars.

Here are some models that I have taken since our last meeting. With one exception all have the first molars extracted. In each of these mouths the mucous membrane is perfectly healthy.

The first case I will show you, and will then pass to Dr. Bogue, is that of Mr. C., aged forty-four years. It is a pleasure to look into his mouth. His first molars were extracted at twelve years of age, by the late Dr. Geo. E. Hawes. He has fourteen fillings and not one approximal cavity. The occlusion is fair. I think Dr. Bogue raised the question about the cusps being worn off. That man cannot wear his cusps off if he lives to be ninety.

The second case is one which, from the description of Dr. Fossume, is a good deal like his case. I first saw it about eight years ago. It is marked "P." She is a young married woman, thirty-two years of age, with as clean and sweet a mouth as possible. She had, as she termed it, "a very bad protrusion of the front teeth." She says her lower teeth touched the upper gums. The dentist who extracted those teeth did the young woman a great service. She has in her mouth twenty-one or twenty-two fillings—three approximal fillings in the bicus-

pids. I did not select these cases for the purpose of advocating any theory, but to show the results of extracting the first molar.

Here is another case—an unmarried lady thirty-five years old. I had those molars extracted. She has on the upper jaw twenty-five fillings, on the lower fifteen, and her teeth have been saved with great difficulty. She has every known filling material in her mouth. I do not believe that her teeth could have been saved without the extraction of the first molars.

Here is the case of a young man with the first molars extracted. He is twenty-two years of age. He has seven cavities.

Here is another case—Mr. D., forty years of age. I extracted those teeth when he was sixteen years old. He has eleven fillings, nearly all of which were inserted at or about the time that the teeth were extracted. He has not one approximal filling. I usually clean his teeth twice a year.

Here is a case where there has been no extraction. This man is fifty years of age. The impression was taken this morning. I examined his teeth thoroughly without finding any cavities. You will notice that some of the teeth are not erupted. There are spaces between nearly all the teeth; this shows that there are no approximal cavities when the teeth are not crowded.

Dr. JOHN I. HART. I do not present these impressions as models of ideal occlusion, although the girl is healthy, well-developed, and well-nourished, and when the third molars erupt I expect that the back pressure will materially improve the occlusion. In the meantime there are but four small fillings in between, in contradistinction to her four sisters, two of whom have been almost exclusively in my hands for dental treatment and the other two having required considerable work prior to my attendance on the first two. Most of the teeth are filled approximately, and owing to the low vitality of the pulps are nearly all pulpless.

Dr. EVANS. I would like to ask Dr. Carr whether he recommends extraction

of the first molars on the principle that it eases up the pressure, and that the easing up of that pressure is a preventive of decay.

Dr. CARR. I do not extract solely for the purpose of relieving pressure. Take a child of ten years of age, having a crowded condition, exposed pulps, or pulpless first molars, and a tendency to decay. When that child is twenty or thirty years old he will probably have a number of necrotic roots, if not other pathologic conditions of the mouth. Why not remove these teeth even if some other molars tilt a little? It will not impair his ability to masticate, and in most instances there will be fewer approximal cavities.

Dr. EVANS. If you extracted the two first molars in the upper jaw, would you recommend the extraction of the two on the lower jaw also?

Dr. CARR. I usually do, but I cannot say exactly without a given case.

Dr. EVANS. I took a model a few weeks ago of the mouth of a young lady—a very intelligent girl. Her mother is also an intelligent, educated person. There could hardly be any mistake about the statements they made. She maintained that the girl never had a tooth extracted, and yet the two upper first molars are wanting. The want of them is an injury to the occlusion and the development of the jaw. You could not get a case that shows the injury done to the arch by the absence of the first molars better than this. On one side, on the lower jaw we have the second bicuspid locked in such a way that it cannot come into position. I consulted with a prominent member of our profession, as a specialist in orthodontia, on the subject of this case. He recommends the extraction in the lower jaw of the first bicuspid on either side. He will then use the first and second molars as piers for a regulating apparatus that will draw the other teeth back.

Dr. CARR. I have extracted teeth for the purpose of regulating. In the case of a girl twelve years of age I advised the removal of two bicuspids. Her father would not consent to have the teeth ex-

tracted, and placed her under the care of a specialist in orthodontia. While still wearing a retaining plate she returned to me with an upper central incisor and two lower central incisors devitalized from pressure. Would it not have been better to extract the two bicuspids, as advised at first?

Dr. EVANS. In presenting that case I made this remark, that I never saw a case in which the first molars had not been erupted. The gentleman to whom I presented the case for examination was of the same opinion—that they must have been extracted. She maintained that they were not extracted. If they were ordinary people I would hardly believe it, but she is a girl who was very well taken care of and her development carefully watched.

Dr. CARR. Would you take a patient's word, or believe all they tell you?

Dr. EVANS. Not under ordinary circumstances; but in this case it is different. She is the eldest daughter. There are very few people who have had the first molar extracted who would not remember it. She never took nitrous oxid gas, so could not have been under the influence of it. Dr. Bogue is somewhat of an authority on this matter, and it is perplexing to me how those first molars are missing.

Dr. C. A. DuBois. I have a cast here of the mouth of a dentist about forty-four years old. He lost the second bicuspid in the right upper jaw more than ten years ago, and one third molar in the upper jaw, the other not having erupted. In the lower jaw he has also lost a bicuspid, but the space is almost obliterated. In spite of these losses the articulation of his mouth is simply perfect, which you will notice by the model. There are four morsal fillings in the lower jaw and four approximal fillings in the upper jaw.

Dr. DEANE. Might I ask Dr. Carr at what age he advocates the extraction of the first molar?

Dr. CARR. I always follow, if I can, Dr. Dunning. He extracted at about twelve. You must meet the conditions

as you find them. You cannot always do as you like.

Dr. L. ASHLEY FAUGHT, Philadelphia. I am much interested in this subject, but I came to learn. I expected to see some casts and get something for my own information. I was very much pleased that Dr. Carr made the remark that there was no special age at which to extract—that you had to meet the conditions. Many persons have an idea that these teeth must be taken out at some particular age. There can be no greater fallacy. There are certain conditions governing the extraction, and those conditions will lead persons knowing them to extract at the right time. In 1880 I had the temerity to advocate the extraction of the first permanent molars for the very purpose Dr. Carr mentioned, and obtained similar results to what Dr. Carr showed to-night, without any serious injury to the occlusion; but as I have grown older I have grown more cautious. I will not say I would not to-day advise the extraction of the first permanent molars, but I am led to believe from a more extended experience that harm can be done by the injudicious and sometimes over-zealous extraction of these teeth. I did not bring any casts, because I did not expect to speak. I have some of the most satisfactory mouths—they could not be much better for use if nature had made them that way—perfect in the limitation of decay, and the occlusion good—where the first permanent molars were taken out at the time I was running rampant on the subject of taking out these teeth. But in some cases I have acted injudiciously, I think, and have since been sorry. To-day I feel that I would take out first permanent molars for just and sufficient causes, expecting beneficial and not detrimental results; but I would exercise more care and consideration now before I extracted them.

Dr. CARR. Dr. Harvett says he had three teeth extracted between eighteen and twenty years of age. He has perfect teeth without any approximal cavities. Dr. Harvett will submit to an examination, if you desire to look at his mouth. [The members here examined Dr. Har-

vett's mouth.] I want to impress upon you that I do not advocate the promiscuous extraction of teeth; but when it is necessary to extract them, I do not hesitate. I have seen but three or four cases in my own practice that caused me to regret that the teeth were removed.

Dr. NELSON T. SHIELDS. It seems to me that the most important question in connection with this valuable address of Dr. Bogue is, What shall we do in cases where it has been obligatory to extract the first molar and an irregularity is apparent—shall we allow it to become worse, or shall we stop it? Would it not be advisable in such a case to arrange a very artistic bridge? We have heard of the ill effects of extracting the first molar, and very largely the paper is correct; avoid the extraction of the first molar if possible, but, if that cannot be done, supply the loss. Suppose a case with only the apices of the first molar left in a very young jaw, in a case say eleven years of age. The rational procedure would be to extract those small apices instead of saving simply a decayed mass and bringing about an unhealthy condition in the jaw. What shall be done afterward? At the age of eleven the insertion of a bridge might become disastrous, on account of the probable decay of the teeth. Therefore you cannot set a regular rule for those things. If the irregularity were going to cause a facial disfigurement of the child it would become obligatory upon the dentist to retain that space, in order that the second and third molars might come in their proper places.

I would like Dr. Bogue, since he has presented this case so strongly, for the benefit of the thousands of dentists in this country to make his answer in a calm, deliberate way, and make some suggestion for the guidance of the dentists who are looking for enlightenment.

Dr. CARR (to Dr. Bogue). We are dealing with practical cases every day. You seem to be a strong advocate of the non-extraction of teeth. Suppose a patient comes to you, say of between ten and fourteen years of age, with poorly developed teeth, a crowded condition, and premature decay; the first perma-

nent molars badly decayed, with exposed pulps: how would you treat this case?

Dr. BOGUE. Dr. Carr did not say anything about surrounding conditions. I do not know what is meant by premature decay.

Dr. CARR. Dr. Bogue still evades the question by professing ignorance of the term "premature decay." When a patient has twenty or thirty cavities in the teeth prior to sixteen years of age I think that it may be justly termed premature decay.

Dr. FOSSUME. A lady thirty-six years of age presented herself to me and asked if I could regulate a protrusion. As a child it might have been beneficial for her to have the first molars removed, upper and lower, because the mouth is disfiguring on account of her large teeth. Dr. Bogue mentioned last time that in cases of improving the patient's beauty it might be advisable to extract the first molars, and so I mention this now.

Dr. CARR. What was the condition of the two bicuspid?

Dr. FOSSUME. All the teeth were perfect, almost.

Dr. CARR. I think I would have extracted the two bicuspid.

Dr. FOSSUME. At her age?

Dr. CARR. No, as a child. I would try to save the first molar, if possible. You said you thought the first molar ought to have been extracted in childhood. I should have extracted the poorest and weakest, which I believe is the second bicuspid, and retained the molars.

Dr. FOSSUME. I think if the first molars are extracted early in childhood the jaw will be somewhat contracted, or developed in a smaller degree on account of less pressure from the erupting teeth.

Dr. I. FRANKLIN WARDWELL. I reside in Connecticut, and when practicing there I tried to carry out the things learned by me in Philadelphia. If I saw that a tooth was badly decayed, in my early days I sometimes looked more to the patient's immediate comfort, viz, getting rid of the tooth—than of the future proper occlusion; but I have taken very few teeth out, always making an effort to save them, so that there might be as

many as possible to do the proper work. I have seen many mouths where the teeth have been unwisely removed, but extracting is a subject I cannot speak upon from my own experience very much, as I have always been opposed to it. I can talk more about what I have saved than what I have destroyed, and I feel after listening to Dr. Angle's very delightful paper, illustrating with the stereopticon how he can improve and preserve the proper shape of the face, that it is most important to make every effort to save the first molars. He always aims to save all the teeth, I believe.

Dr. FAUGHT. A thought has come to me, from the remarks of the last speaker. Where we propose to save the first permanent molar, our care should begin much anterior to it—that is, in the care of the deciduous teeth, with an eye to keeping the first permanent molar in proper condition. I think a great deal of the trouble is produced by the ruthless loss of the temporary teeth originally—from the narrowing of the jaw and the conditions leading to trouble which follow. We should always have that distinctly in mind; if we propose to act conservatively and preserve the molars, we ought to watch carefully the deciduous teeth to maintain them in place, and to prevent any ravages of decay in the approximal or mesial surfaces of the first permanent molar.

Dr. WARDWELL. I am glad Dr. Faught speaks of this subject. We often find the posterior surfaces of the temporary molars, where they rest against the first molars, in a very bad state. If there is decay there, I usually endeavor by filling to get these teeth in a condition where the food will not wedge in and bring about so much decay on the anterior faces of the first molars. All young practitioners ought to have this impressed upon them, to be particular about these surfaces of the first molars when children are brought with these teeth in position. They sometimes come to us as early as three years. If we have patients at that age we can feel that their teeth will be almost perfect, *if* they keep on coming regularly.

A young girl was brought to me by her mother, who had been a patient of mine before she was married. I said: "I do not believe your little girl will ever have any cavities to fill." They were the most perfect teeth I had ever seen. The child was sent away to school, and it was at least two years before I saw her again. I was horrified to find between the bicuspids and molars a great deal of decay, so much so that the pulps were almost exposed. It looked like carelessness on my part, but she was not brought to me as she should have been. I made every effort to preserve the pulps of the first molars, and attended to the decay in other places between the teeth. I really believed at the time the child was first brought to me that there never would be anything to do to her teeth. At the school-girl age, as I call it, they have too many sweets given them, and before we know it, great approximal cavities have formed.

Dr. Faught used to be my college friend, and I am very glad to see him here to-night, and I thank him for mentioning the subject of the anterior faces of the first molars. We cannot be too particular about examining these teeth and keeping them in proper condition.

Dr. BOGUE. I was just talking to Dr. Harvett, and I asked him why he had those teeth out. He said, "Well, I think they did not know better; my father lived to be seventy-eight, and never had a tooth out." There is your case just presented by Dr. Carr: abnormal results from extraction.

You will pardon me, Mr. President, but when I had the honor of addressing you last month, I gave as a subject—"Why I Treat the First Permanent Molar with Respect." I did not say I never extracted; I did not say I always extracted. I said nothing for or against, except that I gave to you very carefully the results that occur when extraction is practiced. I did not presume for one moment to dictate to any gentleman whether he should or should not extract, and when my friend Dr. Carr told me I did not answer Dr. Shields as I should have done, I felt surprised; and when

he followed it up by the remark he has repeated this evening, that he believes a good deal of oral surgery is made necessary by the retention too long in the mouth of teeth and roots that ought to be extracted, I was also surprised. This was in no sense a part of my subject on that occasion. It was because of that that I felt quite pleased at the idea of being able to address you once more on this same subject in my part of the discussion, because to-night it is a mutual affair; there is no one man talking to you.

Man's place in nature is at the top. Before getting to our own teeth as they are—thirty-two of them—we must go through a whole row of teeth that are very unlike the human teeth. We must go through the teeth of fishes, of sharks, the conglomeration of cusps, the welding of three together to make an upper molar and four to make a lower molar. Then they interdigitate, the upper with the lower, and that serves to hold the teeth in position. That is the use of cusps and depressions. Another use is for trituration. When we come to man we have not come to him as he is to-day; we come to him first as a savage, with a denture which we very rarely see unless we go hunting for it in the museums. Those who are dentally well, turn up their noses at us and consider us as cumberers of the earth. They think it was perfectly right when a father found fault with the size of a dentist's bill for his son's teeth, and the dentist said "I must live," that the father answered "I do not see the need of it."

When the savage is born, he either has vigor enough to last him through, and to survive—furnishing the epigram which Huxley made, "the survival of the fittest"—or he has not. If not, he dies away, and we do not even see his skull; ten chances to one he is not properly buried, and he is not found in a museum. If he has vigor enough to survive, he has vigor enough to furnish good teeth. If there were vigor enough to form a set of teeth as they should be formed, that vigor would insure *durable* dentition. That may be easily misunderstood, and I

may be quoted as saying that those teeth may endure. We know that fact by looking into the museums and seeing the different dentures we have there.

Here is the jaw of a savage killed by the British in New Zealand. He has had one tooth broken off, the right canine. All the rest are there. The wear of those teeth, all in their proper position, living on what that savage lived on, is very noticeable, and to me very instructive. He was about forty years of age.

Here is the mouth of a Hottentot, with a space or diastema between the laterals and the canines. That space is kept there by the closure of the lower incisors and canines under the upper teeth and against them, the consequence of which is that the same diastema which you find in the lower animals is perpetuated here, notwithstanding there is no lower canine to pass up; but the upper incisors keep the lower incisors from falling back, and there is the same diastema which you find in your dog or your cat, where the lower canine teeth pass up and in front of the upper canines.

The savage who has a good constitution and who forms his teeth vigorously has teeth which are rather short. They are dense and yellowish and round, and they are durable and self-cleansing. The very act of mastication keeps them clean. The shape of a tooth from the point of a cusp down to the greatest tuberosity is the shape of a roof, barring the triturating ends. If you carefully notice the model of a set of thirty-two teeth, you will see that the act of trituration sheds the food in all directions, so that it does not get to the gums to bruise them, nor lodge between the teeth. The savage eating roots and twigs, and gnawing the meat from the bones, does not need a tooth-brush or a dentist.

I have shown at this very society the model of the mouth of a man fifty-three years old, who never had a tooth-brush in his mouth, and yet his gums were as pink and clean as those of the gentleman whom we looked at to-night, and his breath was as sweet as a baby's—not a cavity existing, excepting between the two molars, where a dentist of St. Peters-

burg had filed. He lived with his men outdoors; he was a railroad contractor. The rough food he ate—hard bread, and meat off the bone—all tended to keep the teeth clean. Nothing was left to undergo fermentation. Take that man, or a man from the wilds of Ireland, bring him here and put him in our furnace-heated houses, feed him on oatmeal, and that oatmeal thoroughly cooked will settle between his teeth and you have a beautiful bed for decay. Almost every Irish servant-girl who comes here with beautiful teeth, teeth you admire as you see those girls land, goes down in three or four years to the dental colleges to have them drawn.

Dr. Thompson, in Dr. Kirk's textbook, brings up those illustrations. I am pleased to see such a good illustration of a set of ideal human teeth. All of the thirty-two teeth are supposed to be in the mouth. The red line drawn there shows the point of contact between the lower third molar and two of the upper molars; then this molar again has a contact with two of the lower molars, and so on, each tooth having two neighbors with which it antagonizes; but there is something which Dr. Thompson did not show and does not state, as far as I know, which is that the anterior cusp of the lower molar fits into the depression in the posterior part of the upper bicuspid, which contact holds those teeth together. I do not know how many gentlemen have looked that up. That condition exists with all natural teeth in perfect condition. It prevents the teeth from separating, and the proper position for the ideal natural set of teeth is tight together. I never yet saw a set of thirty-two teeth where floss could not be passed readily through between all the teeth; but I have seen many cases where extraction has taken place where it could not be readily passed through.

I have already spoken of the differences of the food, and I want to go quickly over this. Civilization projects into modern life teeth that would not naturally endure. That means that the teeth are different in shape from the teeth of savages. I know, because I have

been in museums and have spent days and days hunting for what I could find there. Teeth like most of those in the museums are beautifully formed. There is very little breakage, very little decay, and you will not find it difficult to get a clear idea of what an ideal tooth is. Such teeth do not decay and do not want the dentist.

Having in our hands for treatment the teeth of modern life, we want to know what their condition is, and wherein they differ from the teeth of the savage; we want to know how to get them into a condition most nearly allied to the condition of the ideal human teeth that do not need dentists. We find these civilized teeth of different shape; we find them generally longer than the savage teeth; we find them decidedly of a different texture. We often find these teeth pitted, and with imperfections of one kind or another.

I want to refer to the case Dr. Carr spoke of, and that of Dr. Hart, and to speak of certain cases where the teeth are beautiful and have only had a few cavities, with the inference, whether fair or not, that extraction has prevented the cavities. I understood Dr. Carr to say that he was not sorry, or ought not to have been sorry, for taking out three or four teeth, because he saved the young lady from cavities which would have been formed. I do not think he knows at all; I do not think we can prophesy as to who will have cavities and who will not. I can also refer to a family in my practice. There is the model of the father's mouth from which somebody before my day took out two first molars and two upper bicuspid. I was compelled later on to take out one lower bicuspid, I am sorry to say. I do not think any of you will be pleased with the results which dentistry has achieved in the mouth of that patient. The patient has been in my hands for thirty years, but I thought I would just show you that model. I do not think it speaks well for modern dentistry. That gentleman has seven children, of whom the two eldest and one of the middle children have the best teeth. The middle one is

the one to whom I alluded last month, whose teeth came through with from five to eight cavities in every tooth. The eldest daughter requires almost nothing—she is now married, and the mother of three or four children—while her younger sister is in the condition I described. What is to be said there? This much—that the older children were in entirely different physical conditions in embryo and in early infancy, and the teeth were better formed.

We find also that the cusps of civilized teeth are generally longer than those of the savage. That means that the juncture of the enamel as it is formed is not as accurate as in the savage that survived. As you all know, when the enamel forms it forms very much as ice forms on a pail; it commences on the outside or tops of the cusps and goes toward the center. If the person is vigorous, it generally goes straight over the sulci without a break; but if there is a break, the enamel is deflected and you have a pit there. That tooth is infinitely more liable to split apart than the tooth of the savage, which has shorter cusps and less deep depressions.

Many of us have families in our care where the mother will give a prize to the child who has kept his teeth so clean that he has no teeth to fill at the end of a certain period. But the child cannot help decay occurring in the sulci, or other defective points from which food cannot be removed. We must remedy that, as much as we remedy clubfoot. It is a deformity of the tooth, not a perfect formation.

There is another condition, about which you must not ask me any questions—the condition which has given rise to the modern expression “extension for prevention.” To-day I had a gentleman in my chair four hours, I am sorry to say. He was a splendid man, with splendid teeth. I had spread his teeth apart during several days with those funny little wedges made of fish line, so he did not growl about it, and there was not much sensitiveness. I put on the rubber dam, and also the separator. I excavated the posterior cavity of the first molar,

and in looking at the anterior face of the second molar, I said: “I think you will have a cavity there. My smallest explorer barely enters a bit, but now that we have the rubber dam on and we have time, we had better fill that.” He said, “Go ahead!” I put the No. 00 bur there; the bur entered immediately. I then took a No. 4 bur; it entered just as well. I went on, saying to the patient, “I shall cut as long as that bur does not hit hard substance.” I had reached a No. 5 bur, I think, before I struck solid tooth-substance. How could I have discovered that cavity if I had not happened to have the large opening in the anterior tooth? which had sometime been filled with amalgam. I took the amalgam out, and found it decayed largely all around. There is one of the conditions we must meet; and there are good civilized teeth, too, in that gentleman’s mouth. He is about forty-five to fifty years of age.

Now comes the question which Dr. Carr would raise: Would the extraction of a tooth in that neighborhood have helped that at all? Remember that during the years in which this tooth has been decaying, he has had the constant use of his entire masticating surface. I will now have to fill those places, but suppose certain teeth had been taken out, what guarantee is there that he would be any better off, even in point of decay? That he would have had no decay in the tooth that had been taken out, I grant; but that he would have been infinitely worse off in point of masticating surface is just as true.

Seeing that decay attacks the teeth of civilized man, it was noticed that it did not attack a clean surface, and that was why extraction came to be practiced—first to gain clean surfaces. The first molar was the one which was taken out, because it was most deeply decayed. I venture to say that in the early days of dentistry, it was not the first man that extracted who remembered that that tooth had six years longer in which to decay than the other molar.

DeBlainville, in his book (page 515), says that the molar series of man is divided into pre-molars (which means

bicuspid, of course), *principal molars* (which means the first molars), and post-molars; or, two pre-molars, one principal molar, and two post-molars on each side of the jaw. There is the estimate, the value, and the description given by this distinguished anatomist fifty or sixty years ago.

The next point is its position, being implanted beneath the root of the zygomatic arch—a position which supports the jaws while the temporary teeth are being shed and which helps sustain and aids in the growth of that portion of the skull. The extraction of this molar having proved so disastrous in many cases, we sought many years ago to minimize the evil and still get the good results, as we thought, by extracting a smaller tooth, so we commenced to extract the bicuspids.

Another result of extraction in excess of the thirteen or fourteen I gave last month is that we cannot clean the teeth even by artificial means after we have extracted. Suppose a lower first molar to be taken out, the second molar will lean forward in such a way that the line at the cervix, which ought to be parallel with the gum and quite accessible to the brush, falls over toward the bicuspids. A brush passing over it does not reach it. What is the result? All dental practitioners know there will be cavities there. The rotary movement of the brush is not sufficient to cleanse the teeth between, and when the teeth lean over, still less can we cleanse them. Then, as man has sought out many inventions, he sought out floss silk. That was a subsequent thought, long after brushes were brought out. As vigor became less in civilization, we began to have irregular teeth, and irregular teeth are infinitely more frequent in civilization than among the savages—I think it is true of all savages; I have seen various nations and hunted up their teeth. I saw a lot of Siamese, about twenty of them, and they all had black teeth, artificially stained.

After we reached this point, we began to extract teeth for the purpose of regulating. This you know I regard as a great heresy, and I shall go off my track

if I begin to speak of it, because it is true that it is far more difficult to regulate any set of teeth from which one or more have been extracted than where the whole thirty-two are in the mouth. I speak now of the adult teeth. My belief is in regulating infants' teeth, beginning early, taking from ten to forty days, and I do it when I can. When teeth are brought to us at from twelve to fourteen years and upward, I assure you positively that it is more difficult to regulate where extraction is practiced than when the whole set is intact. I showed one case among the charts I had last month where the upper left lateral incisor was quite irregular because the lower left second bicuspid had failed to erupt, and that is not an unusual case. I showed also four or five drawings last month where, upon getting the first permanent molars into proper occlusion, which was difficult to do on the left side of the mouth, the rest of the teeth began to erupt easily enough, and I saw the little boy last week and told his mother that everything was beautiful.

To go back: When we extract we get a straightening of the lines; we do not get what we expect. Here is a model. Someone took out the two lower first molars. That gentleman was acting after a method, but I am afraid that in that case there was madness in his method! Here is another case where extraction has been practiced. The right side has lost the teeth. How much room has been gained we can judge by looking at it. This matter of extracting the bicuspids came after it was seen how much damage was wrought by the extraction of the molars. It is done for purposes of regulating, but it does not serve the purpose.

There is one other thing that I would like to speak of; that is, the mouth diminishes in size after extracting. The orbicularis oris is greatly diminished. I have seen mouths into which we could hardly get an impression cup. The converse is true also. One case comes to my mind particularly. A family was kind enough to have confidence in what I was doing, and sent the grandfather for a set

of teeth. He had a set in his mouth already. Those that I had made for him were so prominent that when he got home three or four of the family sat down and cried about it. In one month's

time those teeth could not be seen unless he showed them purposely. The lips adapted themselves to the condition.

Adjournment.

B. C. NASH, *Secretary*.

CONNECTICUT STATE DENTAL ASSOCIATION.

Thirty-ninth Annual Convention.

(Continued from page 560.)

THE paper (that of R. A. McDonnell, M.D., on "Skin Diseases of Interest to Dentists") gave rise to the following

Discussion.

E. R. LAMPSON, M.D., Hartford. By way of apology I will say that Dr. C. C. Beach of Hartford was to have discussed this paper, but since he was not able to be here I was asked only a few minutes ago to open it in his place. I think this is a topic that is not as thoroughly appreciated by dentists as it should be and not so much so as it is going to be in the future. The essayist referred to Dr. Oliver Wendell Holmes bringing before the medical profession—in 1853, I think it was—the fact that puerperal fever was an infectious disease. Dr. Holmes was not the first one to advance this idea. Nearly fifty years before that a surgeon in England tried to persuade the medical profession that puerperal fever was contagious, and a few years after Holmes a German investigator tried also to persuade the profession that this was an infectious disease. Only during the last twenty years has it been acknowledged as such. It has taken the medical profession years to appreciate this fact and to acknowledge it. The dental profession may have been somewhat backward in the aseptic treatment of their instruments, but they are coming to it now, and I do not think it will take them as long to recognize the importance of this

as it did the medical profession the danger of transmitting puerperal fever.

Dr. McDonnell said he did not attempt to mention all the diseases which may be of interest to the dentist. There are others which are often confounded with certain stages of syphilis, such as epithelioma of the tongue, the gums, or of the tonsils. These are often confounded with the chancre of the primary stage, and tuberculosis of these regions is often confounded with the tertiary stage of syphilis, both of which occur in the mouth.

I saw a short time ago a patient who had been to one of the best surgeons in Hartford. She had been operated on several times. She gave absolutely no history of syphilis. She had an ulcer in the mastoid region which involved the ear. He finally told her that he could do nothing for her unless he cut the ear off. She came under my care and I put her on potassium iodid and mercury and she is now well. Thus it will be seen that it is not an easy thing to detect these lesions of syphilis. Of course syphilis is the most dreaded of all diseases, and I think the instruments used by men who extract teeth, as well as those in filling, are often responsible for these conditions. Very frequently in extraction, where there is an alveolar abscess, if the instruments are not made thoroughly aseptic, the next person may be infected. Of course there are lots of cases that escape

infection under these circumstances, but that is because the blood supply is so great in this region. The object of asepsis is to prevent the one case in a hundred that may be infected.

There is one very common disease of the mouth that the doctor did not mention that is very easily transmitted, and that is thrush. Of course this occurs most frequently in children, but is very easily transmitted from one patient to another by the use of septic instruments. Fortunately it is very easily cured.

Occasionally you may have in your office a patient with diphtheria, and this disease may be easily conveyed to other patients. In the first place the germ of diphtheria is present in some normal throats, and for some unknown reason it may set up no infection at all, but conveyed to some other person may set up infection which will perhaps prove serious. I think that it is remarkable that diseases are so infrequently conveyed through dental instruments, and I must say that there are instruments used by other professions that are as liable to convey infection as the dentists' instruments, namely, those of the nose and throat specialists. A great many of these are not so careful with their instruments as they should be, which I think is frequently the cause of infection.

I am of the opinion that asepsis is a great element in the success of many of our young practitioners who are thoroughly boiling all instruments before using them in the mouth. It is a subject which you may say is not changing, it *has* changed, and it is to the personal advantage of each dentist, each specialist, and every surgeon, to be as careful as he possibly can with his instruments.

Dr. E. S. ROSENBLUTH, Bridgeport. The paper by Dr. McDonnell is very timely. A paper on antiseptic dentistry is always timely. There is nothing that demands more care than our efforts to protect patients from infection while under our care. We have a great variety of germicides, and water which can be boiled. Instruments mechanically cleansed and boiled for fifteen minutes in a mild solution of sodium carbonate

to protect them from rust are safe to use. An effective steam sterilizer may be constructed at small cost, by fitting a perforated tray and cover to an oblong agate iron dish. Mouth-mirrors and stones are best sterilized in a glass receptacle by the use of sodium dioxid to which a small quantity of water is added and allowed to stand for several minutes. For excavators, burs, clamps, and other small instruments a saturated solution of lye with a few drops of 40 per cent. formaldehyd in a glass vessel will be found convenient, allowing the instruments to remain for fifteen or twenty minutes. Clean napery, it seems unnecessary to say, is essential to the practice of dentistry. Nothing is more conducive to the building and retaining a practice than a plentiful supply of clean towels and napkins, which should be fresh from the cabinet for each patient. There should be no tumbler on the fountain spittoon, but tumblers at hand so that a clean one may be used for each individual.

Dr. A. J. FLANAGAN, Springfield, Mass. This is a very old question. I myself have heard it discussed for the past fifteen years, and we see to-day many moral degenerates who do not take any precautions to prevent infection of their patients. We had last night a very able address by a clergyman on ethics. Perhaps ninety-five per cent. of all professions think of ethics as the relation of one practitioner to another. There are ethics that are higher and more essential, and that is your relation to your patient. Now, it is probably safe to say that in general practice not more than three cases in a hundred that come under our supervision are liable to cause infection; but is it safe to take chances with the ninety-seven cases? It is absolutely necessary that we should treat all cases alike. I think Dr. McDonnell has a good deal of courage to come before such an assembly as this and talk on this subject. He spoke of the question of a coat the operator wears giving infection. Let us go back to the days when it was an unusual thing for a dental operator to wear a coat that was washable. I am sure that you can find a good many of-

fices at the present time where the operator does not discard a coat until it is worn out. Now, suppose when you were sick and carried to a hospital, the attendants were to come in with soiled or half-worn-out coats? If you go to a hospital you will find that they are not taking the ninety-seven chances, for they get down to the fundamental principles of asepsis in each case.

If a man is a moral degenerate in the sense that he does not understand his relation to his patients, he will continue to be the same thing. There is a moral something that has to be educated into the man before he will take these precautions. Let us put ourselves in our patients' places.

Dr. A. C. FONES, Bridgeport, Conn. I do not know that I can add anything to the subject. I would say, however, that those who are in the habit of boiling their instruments perhaps do not appreciate the length of time it takes to cleanse and sterilize them. It has been shown by tests that nothing under seven minutes of boiling is safe. I do not think we should use napkins in the mouth, send them to the laundry, and use them again. Cloths used in the mouth should be discarded.

The old saying that "Where ignorance is bliss 'tis folly to be wise" has passed away to a great extent, to my mind. We can no longer be blissfully ignorant of the dangers of infection. When we go to our meals at public places, hotels, etc., we cannot but think that the coffee cup has never been sterilized from the day it was baked. The forks and spoons have been in the mouths of hundreds of people, passed through some warm water, and possibly wiped off with a dirty towel. We cannot afford, however, to worry ourselves over these conditions, for life would become unbearable; but when it comes to our offices, where we know the dangers and where we can prevent these risks, it becomes our duty to take every precaution.

No man can progress in dentistry to-day unless he is clean. He must be clean with his instruments, with his work, and with himself. If he fails in this particu-

lar he will settle in a rut, with but little chance of advancement. The time has come when every ethical man, as Dr. Flanagan says, has to be educated up to the necessity of these things. After he once realizes the importance of his relations and obligations to his patients he will not be negligent in a single case.

Dr. JAMES McMANUS, Hartford. As a Hartford man and a member of the society I do not want to lose this opportunity of thanking Dr. McDonnell as a brother practitioner of New Haven for coming here and reading so interesting a paper this morning. One gentleman has suggested that the medical profession has been very slow to realize the importance of this question. I think as a profession they have done a great work in this line of sterilization, and in teaching others the importance of it. We have all seen in the past bad results from carelessness, and we will in the future. We have not been so particular as we should have been. Certainly we have it in our power to do a great deal of harm, and we should take all the precautions we can to have everything just as clean as possible.

Dr. McDonnell has presented the subject to us as dentists in a very clear way, and I think he has done a great deal of good. As a profession we have not had these matters brought to our attention as we have since his paper was read some time ago, and I feel very grateful to him for coming here and reading the paper.

Dr. A. C. FONES, Bridgeport. It has been a great many years since I first knew of bacteria, but at that time little or nothing was known of their action upon the teeth. For many years I have been in the habit of cleaning my instruments by passing them through the alcohol flame, and I believe it is an effective method of sterilizing them. As the instrument first passes through the flame a little moisture will appear, but after the second or third pass the moisture disappears and the steel is dry and clean. This practice I have kept up until the present day, and I have never known of a case of infection in my own practice. It is difficult for any organism to with-

stand the flame, even for a second, and I believe instruments treated in this manner are sterile.

Now, Dr. Flanagan says that the coat should be changed more often. Why not change chair, carpets, and furniture of the office every day? If I wear a fresh coat to-day, and still believe it to be clean to-morrow I will wear it and feel pretty sure of not infecting my patients. I think we may go to extremes in this matter.

Dr. Fones claims that when he puts on a coat and is satisfied it is clean he feels no fear of infecting patients. I claim that he does not know whether a coat is clean or not after wearing it once. We have specialists in the line of bacteriology who set a standard for us to go by, and it is safe to live up to it. The bacteriologists say that we must do certain things to protect our patients. I agree with Dr. Fones that they are extremists, but they are specialists who are doing their life-work in this line, and why should we not acquiesce with them and try to live up to the standard they set?

I claim that there is no better way for a man to educate the public than to sterilize his instruments. Now, if the bacteriologist says the steam sterilizer is the thing to sterilize with, I say, Put it in. If they say boiling, let us boil. It is not safe for us to take chances. A great many of the instruments we use are not safe except when boiled, or sterilized in a steam sterilizer. The manufacturers can be taught to make the vast majority of instruments of such a form that a steam sterilizer can do them no harm.

This question is as broad as it is long, and I must say that if we are to be scientific men we must educate the public from a scientific point of view.

Dr. C. W. STRANG, Bridgeport, Conn. I believe in being as thoroughly aseptic as we can, but in the matter of napkins, spoken of by some of the gentlemen, I am not quite ready or willing to give up the doilies that I have used all my life. I believe if doilies are laun-

dered properly they will come back to us in a condition safe to use. I do not doubt that the new aseptic napkins may be safer to use, but I am inclined to think that the impression made upon the patient is not the same as when they can see in your office a drawer full of clean white linen, properly laundered.

After forty years of practice I can stand here to-day and say that I never saw a case of infection where I believed it was contracted from unclean instruments. When I have operated upon a case where I think there is a liability of spreading infection I always boil my instruments thoroughly before using again. I always wash my instruments off in electrozone and I feel reasonably safe in using them after this treatment. I would do unto others as I would have them do unto me. I would put myself in my patients' place, and not subject them to risks that I would not like to assume myself. I would not want anybody to use instruments in my mouth that had not been cleaned after using them in another mouth.

Dr. O. T. RULE, Meriden, Conn. In our consideration of this subject there is one fact we must not overlook; the fact that we all have a vital resistance to every enemy of our system. In view of the fact that bacteria of many kinds are ever around and within us, the only explanation of our living now is that our vital resistance has at all times been able to destroy these bacteria, or to have at least kept them in abeyance.

In the human system we find a difference in degree of susceptibility to infection *i.e.* the nails are immune, the skin is susceptible, mucous membranes are very susceptible, etc. Although our field of operation is entirely inclosed by a mucous membrane, I consider it unnecessary for us to observe antiseptic procedure to the same extent as is done in hospitals, for there is this difference between them and us: in the hospitals the surgeons expose to the atmosphere and its bacteria large mucous surfaces of the viscera which are normally unexposed, also the circulatory systems are tapped,

etc. Our field of operation, although on or near the mucous surface, is one that is always exposed to bacteria and is immune from the usual horde because of its vital resistance. Therefore, I conclude that if we cleanse our hands and have our instruments perfectly sterile, so that we shall not carry any micro-organisms into the mouth by *them*, we have done all that is necessary for the protection of our patients, and have observed the golden rule of which Dr. Strang spoke. I say that the washable office coat is not necessary for this reason. The ordinary brushing of our clothes makes us safe from being sources of infection. We do not demand that the persons with whom we converse on the street should have passed an examination as to whether or not they are disinfected, and our relation to our patients so far as dress is concerned is exactly similar.

While I say that the office coat is not a question of vital importance viewed from the standpoint of asepsis, yet I say that from an esthetic standpoint it seems a good plan to adopt it, if for no other reason than that our patients will be pleased to note this careful attention to dress, and will assume that it implies like care to all other parts of our work.

Dr. A. H. SPICER, Westerly, R. I. It seems to me that one of the greatest sources of infection, and one that we are apt to overlook, is the hand, and especially under the edges of the finger-nails. We may boil coats, napkins, and instruments, but we cannot boil our hands. They are always with us and we cannot overestimate the necessity of absolute cleanliness in regard to them.

Dr. C. B. ADAMS, Bridgeport. I think the last gentleman's remarks are very good indeed. There has been some accusation about our being extremists. Now, I would suggest with regard to sterilizing small instruments that we go to extremes. I do not think it sufficient for us to dip an excavator in alcohol for an inch and a half and call it sterilized. Handling the instruments may be a source of infection. As the last gentleman said, the hands are always with us,

and are liable to carry infection. Even shaking hands is liable to carry infection from one to another. The idea of dipping the instruments into a disinfectant is not sufficient. In operating we all know that frequently the saliva will run down the handle of the instrument and get on your hands, and this will be carried to other instruments in handling, and for that reason I think the handles ought to be sterilized as well as the points, and yet you find it comparatively rare that a man sterilizes the long handles of his instruments. They cannot be boiled without ruining their looks, yet it is just as important that some steps be taken to sterilize them as any other portion of the instrument. This saliva, etc., will dry on the handles, and the next time they are used the hands will probably moisten them, and this is liable to infect your patient. It is not in cutting enamel and dentin that we are liable to infect the patient, but there is more liability of infecting the patient's face from the handles of your instruments; and so I say, gentlemen, it is best for us and for our patients that we go to the extreme in this matter of protection to our patients, by the thorough sterilization of our hands, instruments, etc.

The subject was passed, as Dr. McDonnell was not present to close the discussion, having been called away.

On motion the meeting adjourned until 2 o'clock P.M.

TUESDAY—*Afternoon Session.*

The meeting was called to order at 2 o'clock by the president.

Dr. WILLIAM CRENSHAW of Atlanta, Ga., presented on a chart the matrix devices devised by him, including the molar and bicuspid already shown in the *Cosmos* (see vol. xlv, July 1902, p. 681), and the anterior tooth-device recently completed. His explanations and demonstrations sought to go over the use of the devices in practical work.

Dr. Crenshaw showed how the molar and bicuspid device may be adjusted by letting out and taking up to fit both large and small teeth, and how it may be used

to secure the contour and contact of the teeth and the preservation of the interproximal space. He also explained how the matrix may be used to build the cervico-approximal wall of molars and bicuspid with soft gold or with tin, from a depth so far beneath the gum that the dam cannot be employed until after this wall is built practically to the occlusal surface of the teeth. The explanation embraced the working of amalgams and other plastics, and how to do this without marring the contour in removing the matrix.

The new front-tooth device which was shown for the first time is described by Dr. Crenshaw at page 623 of the current issue of the COSMOS.

Discussion.

Dr. E. S. GAYLORD, New Haven. I would like to ask Professor Crenshaw's definition of what he chooses to call soft or non-cohesive gold?

Dr. CRENSHAW. That question is constantly coming up in the teaching of dentistry and we are making definitions of non-cohesive or soft gold and cohesive gold. I am not sure that I understand what differentiates soft or non-cohesive and cohesive gold. If you should ask me to name a strictly non-cohesive gold I should say Abbey's. That is strictly non-cohesive and cannot be annealed and rendered cohesive. It is ruined for the purposes of the dentist by applying heat to it. I do not know whether Abbey's soft gold has copper in it or not, or whether it has something on its surface that keeps it from cohering. I have not had occasion to use many of the different preparations of gold, and my methods have been rather simple. I began to use foils thirty-three years ago and have never departed from the practice. I believe there is something gained in the dentist taking up one preparation and sticking to it, because he learns to manipulate that well, and I think he loses time and skill in changing from one to another. If you ask me what foil I am using I would say The S. S. White Co.'s No. 4 soft foil, and I will say that my fillings are in the main made of cushions, and these in turn of

soft gold. The soft foil made into cushions is crumpled between the fingers and then straightened out, leaving the sheet, although straightened out, wrinkled. It is then folded two or three times and rolled into a rope and cut into three or four pieces, when you have in this rope what would be equivalent to a size 1 cylinder. This rope doubled upon itself gives a cushion the equivalent of a size 2 cylinder, and again doubled gives a cushion the equivalent of a size 4, and so on. You will find that the cushions of proper size can be condensed readily into the corners and angles of the cavity. This can be done in the mouth easier than out of it.

With regard to the difference, therefore, between soft and cohesive gold, I can give you no better definition than I have already hinted at. The makers tell me that non-cohesive gold is pure gold treated so as to make it non-cohesive. They do not tell all their processes of manufacture, and I do not think it is necessary for us to know them to be able to handle the material.

Dr. JOHN I. HART, New York. I think some form of matrix extremely advantageous in the character of cavities indicated by your essayist. I know of none better than the ones devised by Dr. Crenshaw. I think, however, that his fillings would be stronger if they were inserted as one homogeneous mass, and not separated into an approximal and crown filling. In my practice, before final condensation of the combination of tin and gold, I incorporate into the mass a cylinder or two of cohesive gold. These are held in place by interdigitation, and expose on the surface cohesive gold to which more cohesive gold can be added.

Dr. CRENSHAW. I have never done the kind of work indicated by Dr. Hart. It may be a good idea. There are those whom I have no doubt can, and will, make various combinations of filling materials and probably get better results with the matrix than I have. For the fillings such as I have spoken of in my remarks, I believe the combination of tin and gold is better than the filling entire of gold; and if a patient leaves this to

my judgment that is what I do. I do not believe there is electrolysis of the tin—electrical decomposition of the tin—under gold in the mouth; but if there is, it does not detract from the value of the tin.

In the filling of molars and bicuspidis there is one use of the matrix already mentioned which I wish to emphasize. Take the class of cavities, either in the upper or lower jaw, where they extend down beneath the gum line so far that you cannot fix the dam below its margin. Prepare the cavity and place this device in the mouth, putting a roll of absorbent cotton under the nuts inside of the arch and beneath the tongue, and a roll on the buccal side. Now dry out the cavity well with several pellets of absorbents, having your gold and instruments ready. You can build in this wall of soft gold or of tin to the top of the step in ten or twelve minutes, and you will find that the absorbents placed there will afford protection from the saliva, especially if a saliva ejector be used, for from twenty minutes to half an hour. You can then remove the matrix, put on the dam, dry off the surface of the gold or tin, and proceed to finish the filling with cohesive gold in the regular way. This method can be followed in making amalgam fillings, only you will have sufficient time to build up the largest of them and get the proper contour and condensation before there is danger of the cavity becoming wet without the dam.

Another operation to be performed with this device is of tin and amalgam. Following the line of procedure indicated in the previous operation for keeping the cavity dry, I pack tin foil cylinders or cushions into the approximal wall of the cavity and cap with amalgam. This operation, so far as I know, is original with me, and I believe it will prove a valuable filling. It has been asked if the mercury in the amalgam will affect the tin. I will say that I do not think so; there is no disintegration or softening of the tin on account of the contact of the tin and amalgam. You can do this work in the lower and upper jaw and in mouths where the flow of saliva is pro-

fuse, depending with safety on the absorbent material to keep the filling dry for the required length of time, and of course without the use of the dam.

I think it probable others will be able to get better results from the use of this device than I have, but I have been so pleased thus far that I have been satisfied to rest at this point for the time being.

Dr. Gaylord has reported very satisfactory results from his use of the matrix, and has been very kind in his words of praise of the working of it.

Dr. B. HOLLY SMITH, Baltimore. I have had some experience with this matrix, and I want to say that it has relieved my mind as to some of the most dreaded work in dentistry. I have always thought that a thing which was easy was not to be sought, but here comes a man from the South and offers to the dental profession a little device which circumvents many of the difficulties in the manipulation of gold in the filling of teeth. I want to say that my experience with this matrix has been very pleasant; I am very proud of some of the work I have done with it, and I give Dr. Crenshaw credit for having suggested something to me that has made my life happy. I can do dentistry better because I have the matrix. There are, however, some peculiar conditions that I meet which are still extremely embarrassing to me. For instance, where the approximal walls have been broken down to the gingiva, I would still like to make use of the matrix. I would like to be able to apply the matrix and build that out to the proper knuckle at the approximal surfaces, but I have not yet accomplished that. I have not found it of universal advantage to me in my practice. I have not been able to get universal results with it, but hope to do so with practice.

With regard to my friend Dr. Harf's suggestion of the combination of semi-cohesive gold to facilitate the union between the tin and the gold, I have no faith whatever. The union is doubtless a mechanical one and can always be completed, and you do not want any semi-cohesive gold there. Dr. Crenshaw says

he would not use any but the non-cohesive gold and the cohesive. There is no other. Gold that can be made cohesive by annealing is nothing but cohesive gold. As soon as you impart to the gold one iota of the properties of cohesive gold you have cohesive gold. You can make non-cohesive gold as absolutely homogeneous as cohesive gold if you will spend the effort on it.

Dr. CRENSHAW. Dr. Smith's remarks about the matrix not being adapted to certain conditions are true. I do not claim that it can be made to meet them all, but I will say that in conditions where the walls he speaks of as being broken down to the gingival margin are definable, the matrix is applicable.

The soft gold I am using is called non-cohesive, and is so practically; it is susceptible of being made cohesive, but you cannot weld it until it is annealed, and it is therefore practically non-cohesive gold.

Dr. SMITH. Does not the friction in the working of it make it cohesive? It has been shown that it has the qualities of cohesive gold when annealed, and the friction of motion in working it will impart to that semi-cohesive gold the very quality which you do not desire.

Dr. CRENSHAW. I catch Dr. Smith's idea. It may develop more of the quality of cohesion than I know of in its working, but I think he is confounding the stiffness and hardness resulting from the working of the gold with cohesion. About this, however, I do not certainly assume to know.

The subject was passed, and Dr. E. J. ROBERTS of Augusta, Me., read a paper (an abstract of which follows) entitled

THE SCIENCE OF NITROUS OXID ANESTHESIA.

The science of nitrous oxid anesthesia is understood by but a few, and I think that, even of the few, all are not fully agreed in what the science is.

The object of this paper is to present as far as possible a clear analysis of nitrous oxid anesthesia, which will be largely from a chemical basis. Very many of our applicants to practice den-

tistry are deficient in a clear theory of nitrous oxid anesthesia, and are equally deficient in a knowledge of chemistry.

The outline history of anesthesia is very interesting. In the thousands of years of the world's history from the creation to the present time, so far as we know anesthesia remained unknown, and not until within the memory of many who live to-day has it been in use, and to our senses it is indeed a surprising and a strange realization that we remember the time when anesthesia was unknown. We are proud as a profession that we hold the high distinction that from our ranks was made this wonderful discovery.

Dr. Wells, a dentist of Hartford, Conn., on December 11, 1844, discovered anesthesia in nitrous oxid. This marks the beginning of anesthesia. All honor to Dr. Wells!

September 30, 1846, Dr. Morton, a dentist of Boston, introduced to the world that grand and magnificent agent, ether, as an anesthetic—the greatest boon that ever came to man for the alleviation of physical suffering.

The conception of anesthesia seems to have had its practical beginning when Dr. Mesmer, a Swiss physician, produced a profound sensation in Paris in 1778, through mind operation, by obtaining control of the will and action of his subjects, and in many cases his patient could be made fully unconscious of pain or of surroundings. This phenomenon was termed mesmerism.

An appointed committee of investigation reported a disapproval of Dr. Mesmer and his science, and the matter fell into disrepute until 1842, when Dr. Braid wrote quite a scientific work upon hypnotism, and the idea of anesthesia was revived. Our Congress voted an award to the discoverer of anesthesia who would find a safe and efficient anesthetic, but by reason of dispute as to whom the honor belonged, that award never was paid.

The study of hypnotism I have myself found very interesting, though it is as yet unreliable. In a few cases, in subjects whom I had previously developed, I produced a profound sleep and

retained it at my will, and performed severe operations upon the teeth. Hypnotism is the ultimate of magnetism, and magnetism is a degree of hypnotism. All of us instinctively use magnetism, which is so helpful to ourselves and also for our patient. If we have a knowledge of the principles which promote it, we can use magnetism more successfully.

The most widely used general anesthetics are—

First, *nitrous oxid*, which was the first to be discovered, and which marks the beginning of anesthesia.

Second, *ether*, which for safety and efficiency is the best of all anesthetics for general surgery. It is used by dentists in difficult and protracted cases of extracting teeth. Some dentists use ether exclusively.

Third, *chloroform*, which was discovered in 1847 by Dr. Simpson, an eminent physician in England. This agent is prompt, and is attended with a degree of danger. The danger consists in the fact that it affects the motor nervous system almost simultaneously with the sensory nerves.

Cocain has in a great measure displaced the use of nitrous oxid and ether in our practice.

In most cases of ulcerating and inflamed gums the injection of cocain is painful, and in many such cases it fails to produce the desired result.

Nitrous oxid, when it is properly prepared and intelligently used, is very agreeable; the administration is easily managed. It is wonderfully safe, and is prompt in effect; anesthesia is perfect; all is satisfactory both to operator and patient, and ordinarily there is no struggle, or rigidity of muscles. Cyanosis is exceedingly slight and often is not perceptible, and the mouth-prop is not a necessity, as the mouth can easily be forced open. I claim all this for nitrous oxid when it is *pure* nitrous oxid. Children of tender years and delicate condition, old people, and, in fact, people of all ages and of almost any condition, are able to inhale it with pleasant effect. Pure nitrous oxid and properly washed is fit for use at the moment it is

taken into the receiver from the retort, and when properly kept it is equally as efficient at the end of a month.

Dr. Wells had only partial success, and yet, could he have known it, perfect success was almost within his grasp. Probably the admixture of too much air was the greatest difficulty. The carbon dioxid was exhaled into the gas-bag and re-inhaled, and possibly with some admixture of nitric oxid, and thus nitrous oxid, nitric oxid, carbon dioxid, and air made up a combination of variable mixtures which produced the widely variable range of results. For these reasons nitrous oxid did not come into general use until 1863, when by an organized effort a rude outfit was put into nearly every dental office in the country, and probably in every office these same results were repeated, and many a blundering dentist discontinued the use of nitrous oxid by reason of the frightful results which occurred. In 1868, better instruction and improved apparatus prevented the use of gas from being wholly abandoned. The intelligent dentist made it a success, and others made many failures. By the introduction of manufactured liquid gas many failures were avoided. I have not used liquid gas in my practice. From all I could observe, I saw no advantage in making the change. It was not more efficient, and there is no special difficulty in generating gas, and at that time liquid gas was very expensive, and later I came to regard gas generated by myself as superior to liquid gas. I suspect the presence of a small amount of nitric oxid mixture in the liquid gas, not enough to injure results, but enough to present in a slight degree some of the annoyances which ensue from the presence of nitric oxid.

The symbol of nitrous oxid is N_2O . It is a chemical compound, and this constitutes the difference between it and the oxygen and nitrogen of the air, which is a mixture, and when inhaled it is absorbed by the blood but yields no oxygen, as it passes the round of the circulation and returns to the lungs pure N_2O . The oxygen which is in the body is soon ex-

hausted and anesthesia ensues. It is an inevitable result.

Pure N_2O is non-toxic, it is perfectly inert, and the anesthesia is so placid that one can barely believe that it is anesthesia, and can know it only by experience. There is no rigidity, excepting in the case of hysteria, and we cannot be accountable for what may appear in hysteria. Hysteria is not dangerous, but is sometimes unpleasant to manage. The patient under pure N_2O has no convulsion. There may be some involuntary movement while teeth are being extracted. The mouth is easily forced open, hence not much use for a prop. There is no discoloration, or very little, in the face. At the beginning there is oxygen already in the circulation, and from this a portion of carbon dioxid is formed, which, coming into the lungs, may be, and usually is, reabsorbed. This produces the slight discoloration which sometimes appears even when the gas is pure N_2O .

Ordinarily, for successful anesthesia all air must be excluded, and in the absence of oxygen entering the lungs the blood absorbs the N_2O . The blood has equal attraction for carbon dioxid, and reabsorbs CO_2 with the N_2O . Oxygen is the tonic by which the patient is restored, and he very quickly recovers by taking it from the air.

I do not understand that there is any necessity for a cylinder of pure oxygen. If one is using a bad quality of gas, a little draught of oxygen is a good thing, and a little inlet from the air will furnish the supply. I will say in passing that a few patients will need a small amount of air in cases when breathing breaks up too quickly, as they are not yet in complete anesthesia, and inhalation needs to continue to insure the result. The only contra-indicated patient is one with a badly degenerated heart.

In my experience in generating nitrous oxid, I observed that whether it was done slowly or rapidly, in the same proportion it appeared in the patient. When generated slowly, the patient was equally mild; if there was a degree of rapidity, then there was the same degree of turbulence in the patient; when made

rapidly, the patient was turbulent, and here and there a case would appear which took on frightful indications. I have learned to generate nitrous oxid slowly.

Chemistry teaches us that from the same retort, by excessive heat the product will be a mixture of N_2O_2 with the N_2O , which is another chemical compound. I judge by experience and observation that if while generating N_2O there are puffs of the nitric oxid thrown up, then we have two gases mixed, just as the oxygen and nitrogen of the air are mixed, or as peas and beans in the same bag are mixed.

It is a law in chemistry that when elements combine to form a compound, that compound has a nature peculiar to itself, and may not in the least resemble the nature of the elements which compose it. A mixture of milk and sugar resembles its components, because it is a mixture, but not so with chemical compounds. For instance, H_2O , which is water, is composed of hydrogen and oxygen. Hydrogen is highly inflammable, and oxygen is a supporter of combustion, but the combination of the two gases forms water, and water is used to extinguish fire.

We study ether anesthesia from a physiological standpoint for the reason that it is a local obtundent to nerve tissue which is systemic, because nerve-terminal tissue is present in every minute portion of the body.

Nitrous oxid is an anesthetic as well as ether, differing in that it obtunds nerve tissue from *lack* of oxygen. The nitric oxid has *its* peculiar effect, as observed in rigid muscles, set jaws, and convulsions.

I attribute deep discoloration to the liberation of the oxygen of N_2O_2 . All goes well with the patient until anesthesia obtains, and just at the moment we desire to operate, and the tissues have become hungry for oxygen, the N_2O_2 breaks up and violent combustion ensues, and all the concomitants follow. There being no oxygen in the lungs, the blood absorbs the returning carbon dioxid as readily as it does nitrous oxid, and thus

we have cyanosis. To obviate this I prefer for my own use to generate gas the quality of which I am assured is pure and does not contain even a perceptible trace of N_2O_2 .

One other difficulty sometimes enters into the administration of N_2O ; there is a failure or a partial failure to obtain anesthesia, and someone rises up to say the gas has lost its strength; but as nitrous oxid is a definite compound it does not and cannot lose strength. It can be diluted with air, and if the patient receives enough air, anesthesia will fail. If there be no admixture of air, anesthesia will be positive; it cannot in the nature of things fail. There can be no idiosyncrasy to cause a failure. Usually, where there is a little leakage of air, anesthesia will ensue by continued inhalation of gas, and in a few cases the patients need a little inlet of air to enable them to inhale a sufficient amount of the gas.

My effort has been to show what a beautifully working agent pure nitrous oxid is—charmingly pleasant to the patient and highly satisfactory to the operator—and that it is safe, prompt, and efficient. I have pointed out the difficulties and the way to avoid them, and when difficulties enter in, how to understand them quite perfectly.

Discussion.

Dr. L. C. TAYLOR, Hartford, Conn. After a brief introduction, the author states that—"The object of this paper is to present, as far as possible, a clear analysis of nitrous oxid anesthesia, which will be largely from a chemical basis." He refers to the history of anesthesia as being interesting and as unknown until within the memory of some now living. From a practical standpoint this statement is true; but from a theoretical standpoint, anesthesia has been known for two hundred and fifty years.

He says, "I have learned to generate nitrous oxid slowly." "Chemistry teaches us that, from the same retort, by excessive heat the product will be a mixture

of N_2O_2 with the N_2O , which is another chemical compound." Here let me say that the proportion of nitrous oxid to nitric oxid will be as the proportion of time of slow heat to excessive heat + the ratio of rapid generation. It is absolutely impossible to make nitrous oxid with excessive heat, and it is also impossible to make nitric oxid with slow heat; hence the value of modern apparatus such as is used by our liquid gas manufacturers, as compared to the cheap office outfit. Should a man have a considerable practice he can ill afford to devote the time to making gas, and to trust it to the office-boy means that when he wants to go out it will be hurried up, and the gas, instead of the harmless nitrous oxid, will be the poisonous nitric oxid.

There are so many valuable things pertaining to our profession that it seems to be rather antiquated to be advocating the manufacture of one's own gas. The value of time wasted to produce a good article would not net a man twenty cents per hour, to say nothing of expense and cumbersomeness of apparatus.

Dr. JAMES McMANUS, Hartford. I enjoyed Dr. Roberts' paper very much, and think that he has brought out a good many very valuable points, probably some that few of us here have thought about. With reference to the history of anesthesia, its discovery, etc., I think that Simpson is the only man worthy of mention in this connection besides Dr. Wells. The men Morton, Jackson, and several others were simply quacks with dishonest claims.

Dr. Roberts' method of preparation was a point that I was well pleased with, although Dr. Taylor seemed to take exception to that. I think Dr. Roberts simply wishes to be sure that the gas he uses is absolutely pure; the question of whether he makes any money out of it or not, I do not think entered his mind at all. The making of one's own gas can be done to-day, and I was rather pleased with the doctor's suggestion.

(To be continued.)

THE DENTAL COSMOS

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Devoted to the Interests of the Profession.

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PHILADELPHIA, AUGUST 1903.

EDITORIAL DEPARTMENT.

THE UNIVERSITY OF LONDON AND THE DENTAL DEGREE.

WE note with interest that the Faculty of Medicine of the University of London has under consideration the institution of degrees in dental surgery, in regard to which fact the *Lancet* of May 23d devotes considerable editorial comment. The editorial states that "There is a section which considers that the right course to pursue for the advancement of dental surgery is to raise the standard of training all around—in fact, to bring the general curriculum up to the standard required of students of medicine as a whole. On the other hand, a considerable, if not so numerous, body of persons having a good right to form an opinion hold that the advance should be made by the institution of higher dental degrees, the curriculum being rendered more stringent mainly by requiring from the student a wider and deeper knowledge of the special subjects of dental surgery."

Both parties thus characterized "are represented on the board of studies of dental surgery of the University of London, and they have embodied their views in two reports which are now under the consideration of the Faculty of Medicine." "The majority report, we believe, considers that if the University deems it advisable to institute a degree in dental surgery, then it should only be granted supplemental to a medical degree. The minority report advises the institution of a separate degree in dental surgery, the requirements in general subjects being in advance of those at present demanded by the different licensing bodies."

We trust that our interest in the subject under consideration will be a sufficient warrant for expressing an opinion thereon, and that we may be permitted to do so without giving rise to the criticism of meddling in family affairs. With the effect of the proposed action of the University of London in its relation to existing conditions surrounding the qualification for dental practice in England we are in nowise concerned, but we are concerned with the educational qualifications which ought to fit a man for the practice of dentistry anywhere.

One of the so-called "captains of industry" who began life by serving newspapers to patrons scattered along a particularly difficult and tedious route, and for which he had been paid a salary in inverse ratio to the labor involved, said that though the pay was little and the work difficult he had thoroughly learned one lesson which ever afterward had been of great use to him, and that was that "the easiest way to get there was to go there." We feel that the principle contained in that deduction from experience contains a germ of truth applicable to the making of practitioners of dentistry, and that the axiom when adapted to the case in point might be paraphrased to read, The best way to make a dentist is to make a dentist, and not to begin by first making a physician or some other educational product simulating a dentist.

There is a goodly number of those who feel competent to express an opinion on this subject who contend that because dentistry is an acknowledged department of the healing art, therefore its practitioners should first become graduated as medical men. We are fundamentally opposed to that conception, because—First, the experience of dental educators in general points strongly to the conclusion that men so educated do not make the best dentists; for, among other things, they are likely to be deficient in that manual skill which is only to be acquired by early and thorough special training. Second, because, through their over-training on the medical side and their deficiency on the technical dental side, they do not as a rule render the best grade of service to which the public is entitled. And, third, they are inclined to regard the purely dental aspect of their professional work as something inferior in importance and dignity to its medical aspect, with the result in not a few cases that they are neither good physicians nor good dentists.

The difficulty, as we see it, is one which grows out of the misconception that, in order to attain a knowledge of so-called "medical sciences," one must necessarily pursue the specified curriculum which leads to the medical qualification. This is an error recognized by everyone who has any knowledge of the practical side of modern dental education. The medical curriculum contains much that is not only of the utmost value, but that is even essential to dental education, and these elements of the medical curriculum have been imported into and made a part of the standard dental course of instruction; but, on the

other hand, the medical curriculum contains much which is not essential to the making of a dentist, the compulsory acquisition of which would be wasteful of the student's time.

Medical institutions did not furnish the instruction needed to educate dentists until a public demand for trained dentists brought into existence the separate dental school, which resulted in the creation of a separate, though allied, profession, with its independent organizations, literature, and autonomy. It is too late to retrace the pathways to the point of departure. The growth of dentistry will be toward a broader culture, a higher efficiency, and better public service, but always as an independent profession.

The view here stated is one which has been most forcibly and clearly expressed by Sir Michael Foster in his Cambridge address at the meeting of the International Dental Federation in 1901. Indeed, the addresses and discussions thereon at that meeting should serve as classic guides to those who are undertaking to direct the dental and medical education of the future. The principles there expressed we regard as sound and correct, and with them as the foundation of our educational systems the details may be easily worked out. No false notions of expediency or of social or professional dignity or respectability should swerve us from a firm adherence to the effort to attain our ideal in dental education, viz, to make the best dentists, at the same time so enlarging our conception of the meaning of dentistry as to include all educational factors and means contributory to that end, after which we believe that the attainment should be formally recognized by the conferring of a distinctive degree.

THE NEW YORK-PENNSYLVANIA INTERCHANGE.

WE are pleased to be able to announce the formal ratification of an agreement between the Dental Examining Boards of New York and Pennsylvania whereby a system of interchange of licenses has been made effective.

The details are as follows:

AGREEMENT.

ARTICLE I.

It is understood and admitted that the standard of the professional examination of each board is practically equal, and though different in detail is mutually acceptable.

ARTICLE II.

Licentiates of the Pennsylvania Board who have received the degree of D.D.S. or other recognized dental degree are to be granted licenses to practice in New York state without examination upon payment of the regular licensing fee, provided that the preliminary education of the candidate is equal to that required by the New York statute; and licentiates of the New York Board are to be granted licenses to practice in Pennsylvania under the same conditions.

ARTICLE III.

Immediately after any examination by either board complete sets of the questions used shall be mailed to the Examiners of each state, to the Dental Council of Pennsylvania, and to the Regents of the University of the State of New York.

ARTICLE IV.

Applications for license under this interchange shall be indorsed in New York state by the president and the secretary of the Board of Examiners and by the secretary of the Regents, and in Pennsylvania by the president and secretary of the Examining Board and by the secretary of the Dental Council, and shall be accompanied with the original or certified copies of certificates of preliminary education.

ARTICLE V.

The names of the unsuccessful candidates in each state shall be sent to the secretaries of the Examining Boards and to the Regents or Council as the case may be.

ARTICLE VI.

All papers connected with the examinations shall be placed on file with the Regents or Council and shall be public records.

ARTICLE VII.

Those who have received the New York state license to practice dentistry granted since 1895, or a Pennsylvania license granted since 1897, may apply for the interchange established by this agreement.

For New York: { WILLIAM CARR, D.D.S.
 { WILLIAM JARVIE, D.D.S.

For Pennsylvania: { J. T. LIPPINCOTT, D.D.S.
 { HOWARD E. ROBERTS, D.D.S.

We trust that this practical realization of interstate reciprocity may serve as a stimulus to an extension of the movement among all states having similar dental laws, and that by further adjustment among groups of states a general reciprocity may eventually be established.

FOURTH INTERNATIONAL DENTAL CONGRESS.

WE have just received from Paris official notification of acceptance on the part of the International Dental Federation of the arrangements made for the organization of the Fourth International Dental Congress, in accordance with the action of the St. Louis Exposition authorities and the organized dental profession of the United States.

All things are thus shaping themselves for the successful and harmonious organization of this great meeting, the date of which has been fixed for August 29 to September 3, inclusive, 1904. Our readers will be kept informed of the progress of the work, for which we bespeak their cordial interest and support.

OUR FRONTISPIECE.

THE picture which we publish as a frontispiece in this issue is a fair reproduction of an old sixteenth-century print of unknown authorship heretofore unpublished, and will serve to indicate somewhat the type of practitioner of that period in the exercise of his calling.

BIBLIOGRAPHICAL.

THE PHYSIOLOGY OF MASTICATION AND KINDRED STUDIES. BY J. SIM WALLACE, M.D., D.Sc., L.D.S.; Hon. Dental Surgeon West End Hospital for Nervous Diseases, and Assistant Dental Surgeon National Dental Hospital. London: J. & A. Churchill, 1903. Philadelphia: P. Blakiston's Son & Co.

This little brochure of thirty-two pages embodies a thoughtful and intelligent consideration of the physiology of mastication and the effect of foodstuffs and their mastication in the causation

of diseases of the teeth and irregularities of the dental organs.

While these topics have been the basis of much discussion in our literature, the last word has by no means been said thereon, and the present contribution has the merit of dealing specifically and in detail with the process of mastication in such a way as to throw much valuable light upon the processes of nutrition of which mastication is the antecedent. The book is full of wise suggestiveness and will well repay a perusal.

REVIEW OF CURRENT DENTAL LITERATURE.

[*British Dental Journal*, June 15, 1903.]

THE TEETH AND GUMS AS AN AID TO MEDICAL DIAGNOSIS. BY H. J. CAMPBELL.

The author briefly summarizes the subject of referred pain, and gives the views held at present by many observers on the perplexing question of reflex radiation of pain. Not only is the effect of irritation of the nerve branch manifested by pain in the corresponding skin areas, but trophic effects may also be produced, as for instance when shallow ulcers occur in regions supplied with trophic fibers from the fifth nerve and the source of the whole trouble is really a decayed tooth—this being shown by rapid recovery ensuing when the dental defect has been satisfactorily dealt with.

Difficulties in mastication may be due not to any pathological condition in the teeth themselves, but to some general disease of the nervous system causing either paralysis or inco-ordination of movement—such, for instance, as bulbar palsy, disseminated sclerosis, severe chorea, bilateral paralysis, either sensory or motor, of the tongue, buccinator

paralysis, etc., or to some condition of the temporo-maxillary articulation, such as is not infrequently produced by rheumatoid arthritis.

The author then refers to the studies of Dr. William Hunter on those general conditions which result from oral sepsis, particularly to the form of pernicious anemia which Dr. Hunter attributes primarily to general infection from oral sepsis, the result of neglected cario-necrotic conditions of the teeth. Dr. Campbell does not share the views of Dr. Hunter on pernicious anemia as being caused by oral sepsis, but is inclined to think that these oral conditions are rather the result than the cause of the disease. He is, however, in accord with other observers on the effects that dental caries and suppurative alveolar periostitis may exercise upon the general economy. Next, he briefly refers to oral manifestations of diabetes mellitus which may be recognized by the dental surgeon from the sweet, apple-like odor which the breath not infrequently acquires. He also speaks of the loosening and painless shedding of the teeth frequently met with in diabetes. In dyspepsia the gums become spongy, a condition not unlike that met

with in scurvy. Other conditions met with in the mouth which may afford valuable information to the physician are the ground-down teeth of the gouty, the pericementitis occasionally met with in the rheumatic, the pallor of the mucous membrane in tuberculosis, and the pigmentation of the membrane in Addison's disease. Finally the essayist speaks of the oral manifestations of poisonings with phosphorus, lead, and mercury, and he concludes his paper with the statement that in the cases cited, as in many others, the mouth affords valuable evidence of the general condition and state of health of the patient and serves to show how far local treatment combined with general treatment may be required, or whether local treatment alone will meet the needs of the case.

[*La Stomatologia*, Milan, May 1903.]

THE EFFECT OF BLUE LIGHT. (EDITORIAL.)

Dr. Ninine, of the Nicolas Hospital of St. Petersburg, has found that blue rays have the property of diminishing pain. He has recently made a practical application of his discovery and has obtained results markedly satisfactory. He projected a stream of blue light upon a patient and performed under its influence an operation which lasted twenty minutes. The patient was not in an unconscious state, but nevertheless did not experience any pain whatever.

[*Dominion Dental Journal*, Toronto, June 1903.]

ADENITIS. BY HERBERT BRUCE, TORONTO.

The lymphatic glands about the neck are of considerable importance, from a surgical standpoint, in the saving of other parts from infection. Their function is to collect and drain the lymph and deleterious substances. The lymphatic glands in the submaxillary region are most liable to infection through the mouth. If there be any abrasion in the mouth or as a result of injury produced by an instrument that is affected with bacteria, adenitis will be produced by the bacteria being carried through the lymph streams. Any pathogenic organism that is present in the mouth, if carried to the glands, is almost always sure to give rise to acute adenitis.

Accumulations of tartar around the necks of teeth producing a lacerated condition of the gums may eventually result in the production of adenitis. If those infected areas do not break down in the form of pus, they are likely to subside into a chronic swelling, changing the disease from acute into chronic.

The glands when in an infected state are very sore to the touch, and can easily be felt under the skin, so that when these glands of the neck are tender to the touch, the inference is that they are the seat of inflammatory conditions. Later, the patient complains of a throbbing sensation in the affected regions, the skin becomes reddened and adheres to the glands, these symptoms being the precursor of periadenitis. If pus be formed it will eventually burst through the skin. Chronic adenitis may be simple, tuberculous, or syphilitic. These are the three commonest forms of adenitis, and occur more often than the acute form. The simple type often occurs in children and in young adults, and is commonly associated with pediculosis, with chronic discharge from the ear, or with eczema of the face.

The author describes the tuberculous and syphilitic forms of chronic adenitis, and concludes his communication with a few remarks on lymphatic leukemia, and on Hodgkin's disease, sometimes called pseudo-leukemia.

[*Revue Odontologique*, Paris, May 1903.]

TREATMENT OF ACUTE SINUSITIS IN CHILDREN. BY DR. BOURRAGUÉ, SURGEON OF THE FRENCH ARMY.

This interesting study on the pathology and treatment of sinusitis, which appeared originally in the *Revue de Laryngologie*, has been reprinted in the *Journal de Médecine*, whence the *Revue Odontologique* has condensed the résumé which here follows:

Acute or catarrhal sinusitis, which is concomitant with acute inflammation of the pituitary membrane (acute or infectious coryza in the first stages) is characterized by a slight mucous oozing which gradually fills up the antral cavity. This pathological manifestation can be treated by the same method as employed in cases of inflammations of the pituitary membrane, namely, with fumigations of decoctions of such aromatic plants as thyme, rosemary, etc. These fumigations may be supplemented with others from the following solution:

R—Menthol,
Tar, āā 5 gm.;
Tinct. eucalyptus, 250 gm. M.

Sig.—One teaspoonful to a liter of warm water to be used in fumigations for from five to ten minutes two to four times daily.

If the engorgement of the pituitary membrane should close up the ostium maxillare, the secretion of the mucous lining of the antrum will be retained within the cavity,

causing suborbital pain. If such should be the case, intranasal sprays of cocain hydrochlorid 1:10 and adrenalin will reduce the tumefaction, thereby allowing the escape of the secretion. The cocain solution which the author recommends is as follows:

Adrenalin chlorid,	2 gm.;
Cocain hydrochlorid,	0.30 gm.;
Cherry-laurel water,	5 gm.;
Sterilized water,	25 gm.

Dr. Bourragué asserts as the result of his clinical experience that by the procedure here described it is possible to eradicate these inflammations when in their incipient stages.

[*Oesterreichische Zeitschrift für Stomatologie*,
Wien, May 1903.]

ANKYLOSIS MANDIBULÆ VERA. BY
PROF. DR. L. W. ORTOR.

Professor Ortor (*Deutsch. Zeitschr. f. Chirurgie*) has had the occasion to clinically study seven cases of true mandibular ankylosis and reports the results of his observations. These cases were the sequelæ of diseases which had affected the respective sufferers in their youth. In these various cases the mandible showed signs of faulty development. The face had an elongated appearance, and the mouth could be opened a distance of only a few millimeters. The upper front teeth protruded extensively and the lower ones occluded against the palatal mucous membrane. The disturbance was apparently due to mandibular changes, the sequelæ of scarlet fever, smallpox, and suppurative disorders of the ear. The treatment consisted in resecting the articulation, an operation often very difficult to perform. After the operation the patients were able to open the mouth a distance of from three to four centimeters.

[*Bulletin Méd. de la Clinique, Saint-Vincent-de-Paul*, Bordeaux, May 1903.]

DEGLUTITION OF A VOLUMINOUS PROSTHETIC APPLIANCE. BY DR. S. DUNOGIER.

The deglutition of prosthetic appliances is by no means a rare occurrence, and such being the case it is of the utmost interest to observe that severe injuries seldom follow cases of this nature. In the majority of cases the appliance follows the course of the digestive tube without great annoyance to the patient, and is easily expelled. On the other hand, if the appliance be obstructed in its way because of its volume or on account of the narrowness of the tube, or further, if the appliance is one of the clasp

variety, and it should become hooked to the walls of the tube, serious phenomena may follow. The author calls special attention to the necessity for the general surgeon to obtain precise data as to the shape, size, volume, and location of the solid piece before undertaking surgical means for its removal. He then describes in detail the case of a patient who accidentally swallowed a partial upper plate of three teeth and two small clasps, and its evacuation through the digestive tube eight days after the occurrence of the accident.

He draws from his observations the conclusions that the services of a dentist are valuable to the general surgeon in the treatment of this variety of cases; that the walls of the digestive tube are markedly elastic; and lastly, that patients need not be extremely afraid of the consequences of the accidental deglutition of a prosthetic dental appliance.

[*Revue de Stomatologie*, Paris, June 1903.]
ON LINGUA NIGRA.

This interesting and concise dissertation, originally published in the *Semaine Médicale*, is quoted *in extenso* in the current number of the *Revue*.

The disorder has been designated by different names, viz, "Nigritis of the Tongue," by Bertrand de Saint-Germain; "Black Tongue," by Raynaud; "Extrinsic Black Coloration of the Tongue," by Gubler; "Piliform Epithelial Hypertrophy," by Féréol; "Glossophytia," by Dessois; and "Melanotrichia Lingualis," by Surmont.

As a result of the careful and painstaking study of this rare disorder by Dr. Bouchez it has become possible to obtain more precise information on the nature of this disease. The disturbance affects that part of the tongue in front of the lingual V. The tongue is colored black, and presents a velvety appearance which seems to be due apparently to the presence of a superficial coating, but upon examining the organ carefully, and upon pressure with a specillum, it is found that the peculiar appearance of the tongue is produced by an abundant hairy growth. The hairy plaque may be of varied dimensions. It may cover the entire dorsal surface of the tongue anterior to the lingual V without affecting the margins and the tip of the organ. It may also appear in the shape of small separated dots, which later on may unite, forming a single plaque, and lastly, the disease may affect only one side of the tongue. The aspect of the organ may vary in different cases, but one thing remains clear, namely, that neither the tip, the borders, nor the lower surface of the organ become affected.

Melanotrichia lingualis is, in the majority of cases, a painless disease, and it is only by mere accident that the patient becomes aware of its presence. The subjective symptoms are not of great importance. In some cases the patient complains of dryness and puffing of the tongue, intense salivation, and sometimes of an acid taste. The disease may be of very short duration, as at times it only lasts a few days, but in other cases, as in the one described by Dr. Surmont, it may last months and even years. It is interesting to call attention to the fact that sometimes the black appearance of the tongue disappears without any treatment, the disorder, however, returning with the same intensity at a more or less distant period. The etiology of this disturbance is unknown, although it has been stated that it is related to disorders of the digestive tract. Dr. Bouchez, as a result of his careful observations, believes it to be due to a trophic disorder, brought about by a local predisposing cause, producing a marked dilatation of the capillaries, which is in turn responsible for the hypernutrition and proliferation of the papilla,—the apparent hairy growth being due to an exaggerated elongation of the papilla. It should also be noted that thus far medicinal treatment has been of no avail whatever.

[*Archives de Stomatologie*, Paris, May 1903.]

COMPARATIVE DURATION OF THE ANESTHESIA PRODUCED BY COCAIN, TROPACOCAIN, EUCAIN, AND ACOIN.

Spindler (*Clinique Ophtalmologique*) publishes the results of some interesting experiments which he made upon himself and his two assistants in order to study the comparative activity of these agents when used hypodermically and for the purpose of producing local anesthesia. The several agents offered as substitutes for cocain do not possess any appreciable advantage over this agent. By making hypodermic injections of 5 c.c. of solutions at 0.2:100 he has obtained the following results: The anesthesia produced with cocain and with tropacocain lasted from ten to fifteen minutes; that produced with eucain from ten to twelve minutes, and that with acoin from forty-five to fifty minutes. The results were the same with solutions of one-half the strength of that employed in the previous series. With the dose of 5 c.c. the injections are absolutely painless and the anesthesia appears almost instantaneously in the case of the first three agents mentioned and in one minute after the injection in the case of acoin. The vesicle

produced by the injection is more marked with acoin than with any of the other agents. The pain produced by the injection is likewise more marked with acoin, but no subsequent pain followed its use as was the case with the other anesthetic agents, the use of which was followed by a painful itching, lasting as long as twenty-four hours.

The results of these investigations lead the author to substitute the method of infiltration anesthesia with cocain by the following:

R—Acoinae,	0.1-0.2 gm.;
Sodii chlorid.,	0.8 gm.;
Aquæ destill.,	100 gm. M.

Sig.—For local anesthesia.

With this solution it is possible to perform painlessly operations lasting over fifteen minutes. The long duration of the anesthetic period in the case of acoin permits the removal of tumors and the performance of several other operations. In neuralgia the use of acoin has given rather satisfactory results.

[*Dental Summary*, June 1903.]

RECURRENT SEPSIS IN ROOT-CANALS.

BY G. S. JUNKERMAN, CINCINNATI, OHIO.

In root-work the operator should always bear in mind the preservation of the pericementum, and therefore the use of any medication or method that cannot be so controlled as to preclude the encroachment upon this membrane should be discarded as defective. The author speaks adversely of the method of indiscriminate pumping of different medicinal agents into root-canals, as the first aim in root-work should be to secure the perfect sealing of the apical foramen without obtruding a foreign material of any kind beyond the extreme limit of that foramen. It is of very little moment, Dr. Junkerman asserts, what material is used to fill root-canals, if the apical foramen is sealed with the correct material. Root-canals should always be opened thoroughly, so that the operator may be enabled to see, as well as feel, the apical foramen. This may be accomplished with a root-reamer without fear of breaking off the drill if the operator avoids the jamming of it. Regarding the material to be used in sealing the apical foramen, the author says that it should be in itself germ-proof, slightly antiseptic, and at least non-irritant.

The author has devised a filling material which he recommends as possessing these three properties. It is composed of cotton, tincture of iodine, and tannic acid. A small thread of cotton on the end of a smooth broach is saturated with tincture of iodine;

it is then dipped into pulverized tannic acid, when it is ready for introduction. This mixture becomes as hard as cement, a statement which can be substantiated by taking a ball of cotton, saturating it with iodine and tannic acid, pressing out the surplus liquid, and laying in the sun to dry.

[*Journal of the British Dental Association*, London, June 1903.]

REMOVAL OF LIVE PULPS UNDER PRESSURE ANESTHESIA. BY W. T. HOLFORD.

There are two ways, the author says, by which a pulp may be removed by pressure anesthesia: one by the introduction of cocaine and eucaine into the parenchyma of the organ by means of a hypodermic syringe, and the other by the use of these same agents without the agency of the hypodermic syringe, using pressure obtainable by packing the cavity with unvulcanized rubber to accomplish the introduction of the anesthetic agent. The first of the two systems is especially indicated for the removal of pulps from any one of the incisor teeth fractured diagonally, exposing one corner of the pulp. The tooth should be kept dry, and after gently laying a small crystal of cocaine and eucaine over the

exposure it is allowed to dissolve in the small quantity of blood serum that will exude. A ten per cent. solution is then injected into the canal by means of a hypodermic syringe with the needle cut short, so that only about one-sixteenth of an inch projects beyond a small shoulder, on which the author places a small piece of unvulcanized rubber. The point of the needle is then placed against the exposure, when the piston is pressed, first gently and then with gradually increasing force, stopping for one minute as soon as any symptom of pain appears. If this be kept up for about five minutes it will be possible, so the author says, to open up the canal thoroughly and to remove the nerve whole by means of a Donaldson broach. The author emphasizes the necessity of getting as near to the apex as possible and of removing the entire organ, as otherwise trouble might occur. When the nerve has been removed two conditions will probably be met with; one is a fairly considerable hemorrhage and the other a certain degree of sensitiveness of the walls of the canals. Both these conditions can be overcome by swabbing out the canal with a fifty per cent. solution of sulfuric acid, which stops the bleeding and reduces the tenderness about the walls of the canal.

PERISCOPE.

A Hint in Impression-Taking.—When the impression has been taken in plaster of Paris, do not forget to scrape what represents soft parts on the model.—W. M. WUNDER, *Dominion Dental Journal*.

To Remove Anilin Stains from the Fingers.—The *Practical Druggist* recommends a solution of seven parts sodium nitrate and fifteen parts dilute sulfuric acid in five parts of water.—*Modern Medicine*.

Rapid Changes in the Course of Putrefaction.—It must be borne in mind during the treatment of a tooth in which the pulp is undergoing putrefactive changes that there are a great number of chemical changes taking place from hour to hour, and the nearer we come to an understanding of the state of putrefactive change the more intelligently can we treat the tooth with a view to preserving the translucency of its structure.—GEO. W. COOK, *Dental Register*.

To Avoid Dark Joints.—If you don't want any dark joints when sections are used, pack pink rubber against the joints. Let it extend at least one-eighth of an inch beyond the joint. Do not cover the pins. Pink rubber is cheaper than gold.—L. W. JORDAN, *Dental Summary*.

To Remove Stain from Necks of Teeth.—In cases where the gingival third of the teeth is coated with dark green stain, apply equal parts of tincture of aconite, tincture of iodine, and chloroform. Then use a brush with pumice and if necessary repeat the application.—W. C. SMITH, *Dental Review*.

Mouth-wash.—

Chloral hydrate,	
Tinc. eucalyptus,	āā. ʒss;
Alcohol,	ʒiij;
Oil of peppermint,	gr. xv. M.

Sig.—A teaspoonful in a glass of water.
—*Monde Dentaire*.

Ethyl Chlorid.—The employment of ethyl chlorid I have found to be very effective in all cases. While I do very little extracting, nevertheless, whether it be used for the extraction of a tooth or the opening of an abscess, I find that it is not attended with the possible embarrassing results of a cocain solution.—P. B. McCULLOUGH, *Internat. Dental Journal*.

The First "Doctor of Medicine."—The title of "Doctor" (according to the *Journ. méd. de Bruxelles* for December 31, 1902) was for the first time made and conferred in the twelfth century, by the University of Bologna. The first doctor of medicine was Gulielmus Gordinio, who was invested with this dignity by the College of Aosta, in 1220.—*New York Med. Journal*.

Therapy of Pulp-Putrefaction.—If the pulp-chamber has been closed it is best to use an agent like thymol or one of the cresols—the metacresol, orthocresol, or paracresol. But the tricresol is preferred to any of the others just named. The cresol compounds are more active on the forms of bacteria that cause putrefaction than on those of so-called pus-producing bacteria.—GEO. W. COOK, *Dental Register*.

Potassium Iodid Hypodermically in a Syphilitic Gumma.—Labadie, LaGrave, and Rollin (*Journ. de méd. interne*, June 1, 1903) have cured a syphilitic gumma without internal medication by the local hypodermic injection of potassium iodid, 2 c.c. daily. The gumma disappeared after the seventh injection. The treatment is extremely painful.—*New York Med. Journal*.

Platinum Matrix for Labial Cavities.—For labial cavities a piece of platinum as large as consistent should be used, to facilitate handling and to give it more stability and so prevent springing. In such cases I tie the matrix in place with floss silk, forming a loop, bringing the ends to the front and securing with a half surgeon's knot.—HENRY C. RAYMOND, *Dental Register*.

To Replace Broken Plaster Tooth on Model.—When a plaster tooth or crown is broken from a model the best way to replace it is to drill a hole about one-eighth of an inch in both the model and the broken tooth, forming a pin of cement after you have placed cement on both parts and correctly placed them. The cement used for this purpose should be mixed very thin.—J. R. HERZOG, *Dental Summary*.

To Prevent Fracture of Facings.—When they are backed and then soldered to a strip of metal, as when facings are used in long bites in plate work, it is essential that the strip of metal shall project beyond the backing and reach under the end of the facing, so that the tooth may rest on and be supported by said strip, and not by its pins only.—STEWART J. SPENCE, *Dental Era*.

Polishing Stains from Lingual Surfaces of Lower Incisors.—Frequently it will be found difficult to reach these surfaces with the ordinary rotary brushes. Substitute for these a moose-hide wheel about one-half inch in diameter, and run it as nearly as possible parallel with the long axis of the tooth. In this way the most inaccessible surfaces may usually be reached. The wheel, however, is not so effective for accessible surfaces as the brush.—*Dental Review*.

Congestion of the Eyes.—Leidy (*American Medicine*) recommends for gouty congestion of the eyes, with pain and tenderness, the following, which not only relieves pain, but clears up the congestion:

Formalin,	.005
Cocain hydrochlorid,	.1
Distilled water,	10.

Two or three drops are instilled into the eyes.

—*Medical Times*.

Porcelain Inlays Used in the "Thirties."—Porcelain inlays, I think, have been before the profession not fifteen years, but at least four times fifteen years. We can find record of them year by year from that time to the present. When Mr. Murphy began his work in Philadelphia in 1835 he had to fire up a large porcelain furnace, and it was only when the little convenient furnaces came into use that the work was done without great trouble.—W. H. TRUEMAN, *Internat. Dental Journal*.

Preparation of Cavities for Porcelain Inlay.—It is not necessary to cut cavities too deep, nor, on the contrary, must they be too shallow, or the cement will show through the filling. Never make a cavity perfectly round, and always avoid straight lines in cutting the margins. Slightly curved lines show the joint much less, and are more pleasing to the eye. There must be no bevel to the margins; they must be well-defined, perfectly even, smooth, and polished wherever possible. One of the main secrets of success in the work consists in having perfect margins.—HENRY C. RAYMOND, *Dental Register*.

A sure method of preventing base rubber from running into the gum pink is to take care in packing and flasking to have the vents made only at the back of the flask. Close the flask carefully when packed, bringing the front part down first, then carefully and slowly bringing back part of flask together. This causes all surplus rubber to run into the vents at the rear of the flask, leaving the front portion of pink rubber just where it was first placed in packing.—J. R. HERZOG, *Dental Summary*.

Cataphoresis in Gout.—Dr. Charles Begg claims to have obtained excellent results in the treatment of chronic gout and rheumatoid arthritis by this procedure. Two methods may be employed: either the joint is immersed in a solution of the drug to be employed, the positive electrode being placed in the bath and the negative on an indifferent part of the body, or the positive electrode is kept as wet as possible by frequent applications of the solution. The author employs a large negative electrode and a small button-shaped positive electrode.—*Edinburgh Med. Journal*.

Adrenalin for Sensitive Dentin.—As an agent for sensitive dentin, adrenalin alone, with or without pressure, will affect the dentin so that it can be excavated without pain in every instance if applied until the pulp is affected; but I have been afraid of its effect upon the pulp, and have used it generally without pressure, which renders about nine out of ten cases painless. I have as yet had no deaths of the pulp following such use. It is certain that it has a greater action in this direction than any other agent advocated.—W. CLYDE DAVIS, *Items of Interest*.

Bactericidal Property of Bone-Marrow.—Dr. A. Henke (*Centralbl. f. Bakt., Parasit., u. Infektionskrankh.*, April 22, 1903) has experimented upon the bactericidal property of the bone-marrow by injecting cultures of staphylococcus pyogenes aureus directly into the blood and into the marrow, as well as by way of the trochanter major. In from two to four days the animals were killed. In none of the cases was an osteomyelitis found, combating the usual view that staphylococci evoke the disease. In very acute cases of the disease the author has been able to isolate small rods which he has not identified. They were colored by Gram's stain, were movable, and did not liquefy gelatin. Injected intravenously into rabbits, these organisms invariably produce typical and characteristic lesions of the bones.—*New York Med. Journal*.

Porcelain Inlays: Contour Work.—In contour work, before stripping the platinum from the filling, it should be tried in the mouth, when it is too full it may be ground off and put in the furnace and reglazed. It is a good plan to try in the cavity before putting on the final layer, to see if it be too full or not full enough. There is one thing I must warn you against when trying in for this purpose: Don't try and match your color at the same time, for the platinum overlapping the tooth gives it a bluish cast, and makes it appear much darker than it really is.—HENRY C. RAYMOND, *Dental Register*.

Correction of Contracted Dental Arches.—In cases of contracted dental arches very frequently it is best to expand both upper and lower, and I have not found the wearing of two plates at once much objected to by the patients. I use split vulcanite plates with a piano-wire spring, and almost always make the plate cap the back teeth, and instruct the patients to wear them all night and as much during the day as they conveniently can. To make the plates clip in tightly it is very important to slightly cut into the lingual surfaces of the bicuspid and perhaps the molars on the model before vulcanizing on it.—HARRY BALDWIN, *Brit. Dental Journal*.

Faulty Nutrition.—This may occur from an insufficiency of food, or from inappropriate food, or from its improper preparation. In illustration of this statement it may be said that a large proportion of our bread supply is in its preparation almost wholly deprived of its bone-making material. The lime salts are by the bolting process removed with the brans, the starch and gluten being retained, these constituting the flour of which ninety per cent. of our bread is made, although it is impossible to make with it the most nutritious bread. The question of the presence of lime salts in food is a very important one, one with which those who prepare our food should be thoroughly familiar, and especially is this true of those who prepare food for the supply of infantile life. Another very important question is the character of the food supply which the mother receives during the period of lactation. Those who have given close attention to the subject inform us that very few mothers afford the children in infancy food supplies with bone phosphate in sufficient quantity to meet the demands of the growing bone structures of the body, and especially of the teeth. This occurs, of course, because of an insufficient supply of proper food by the mother.—J. TAFT, *Dental Register*.

Cocain Hydrochlorid as an Antidote of Morphin.—The past year has furnished but few new aspects of the therapeutic uses of cocain. Prof. Ed. T. Reichert draws renewed attention to the fact that cocain is an antagonist of morphin and available for counteracting the intense depressing effect of the latter drug upon the metabolic process and thermogenesis. In morphin intoxication cocain should, however, invariably be used in small, carefully repeated doses, since different individuals are very differently affected by cocain, and it has been shown that in the case of morphinized dogs small doses act better than large ones.—*Merck's Report*.

Treatment of Hemorrhage After Tooth-Extraction.—I have the patient rinse his mouth with an antiseptic solution. I then syringe the bleeding sockets in which the teeth were with pure hydrogen dioxid, then follow with an antiseptic solution. This stops the hemorrhage, but should it recur I repeat the above, and then apply as an actual cautery a sharpened stick of lunar caustic run down very carefully into the very bottom of each socket; then pack tightly with antiseptic cotton held in place with a compress. The hydrogen dioxid dissolves more thoroughly the clots from the mouths of the vessels, gives oxygen to the blood, and stimulates the muscular contraction, and nature is allowed to assist itself.—H. E. BELDEN, *International Dental Journal*.

Anesthetic Action of Yohimbin.—The effect of this drug on the mucous membranes, and also on the sensory and motor nerves, has been made the subject of a series of animal experiments by A. Loewy and F. Muller (*Münch. med. Woch't*, April 14, 1903). In comparison with cocain they found that the two drugs varied from the quantitative standpoint, but qualitatively acted about the same. By direct application of yohimbin on motor and sensory nerves their power of conductivity was diminished and even stopped. Furthermore, the application on the sensory nerve-endings of the mucous membranes caused anesthesia. As with cocain, this effect is only a temporary one and is succeeded by normal conditions. The practical value of this anesthetic is still in need of clinical tests. A series of similar experiments have also been made for determining the effect on the sympathetic system. Injections into the dural sac have been made and the action studied on the vaso-motor distribution of various vascular areas. These observations are to be published at a later date.—*Medical News*.

Preparing Approximal Cavities in Anterior Teeth for Porcelain Inlay.—In approximal cavities in the anterior teeth, extending to the occlusal edge, the palatal wall is cut in excess of the labial, as the latter should aid in resisting the outward force exerted in mastication. In such a cavity a broad base at the gingival aspect should be made, which is a seat for the filling. A form of seat must be made in all cavities, generally in the form of a triangle, which gives the filling a decided base to rest on, and also prevents it from slipping out of place when setting it. It is not retention, but simply a seat.—HENRY C. RAYMOND, *Dental Register*.

Matching Colors in Inlay Work.—It does not matter how near one comes in matching the tooth, the natural translucent effect so necessary cannot be obtained when a solid color is used. Every tooth has more than one color or shade, which can best be described by calling them underlying colors. A tooth that at first sight appears to be just one color will, when closely examined, be seen to have two or three or more underlying colors, and to get the effect we are striving after, these colors must appear in the filling. This can only be done by baking the different colors in layers. It may seem almost impossible at first to see these different colors of the teeth, but you will be surprised when you have practiced looking for them how in a short time you will begin to detect them easily.—HENRY C. RAYMOND, *Dental Register*.

New Method of Diagnosing Disease of the Maxillary Antrum.—S. Pietro (*Arch. Ital. di Otol. e Laryn.; Journ. of Eye, Ear, and Throat Diseases*, vol. vii, No. 4) calls attention to a new method of diagnosing disease of the antrum of Highmore. The instruments required are two rubber tubes of the length of one hundred and sixty centimeters and each having at one end a rubber tip for the ear and at the other a cylindrical tube three centimeters in length, and a tuning-fork of sixty-four or ninety-six vibrations. The tips of the tubes are placed in the ears and the glass tube on the outer wall of the antrum, the canine fossa, corresponding points on the alveolar border, the free margins of the molar teeth, etc. The tuning-fork is then set in vibration and placed on the dorsum of the nose. If either antrum contain pus the vibrations will be heard more distinctly on that side. The writer has made observations on dead bodies and on the living subject, and claims this to be our most certain method of diagnosing antrum disease.—*Interstate Med. Journ.*, October 1902.

Nargol.—Nargol is an argentic nucleinate which contains ten per cent. metallic silver and which is employed like protargol. Comparative investigations of the properties of nargol, protargol, and silver nitrate have led L. Ewing Schwarz to the conclusion that nargol produces no irritation and that it possesses powerful astringent properties. Nargol surpasses silver nitrate by its penetrating power, protargol by its superior durability and milder irritating effects upon the eye. Nargol is indicated in various forms of inflammation of the conjunctiva and in ulcers of the cornea. Its application takes the form of ten to twenty per cent. aqueous solutions.—*Merck's Report.*

The Platinum Matrix for Inlays.—During the fitting and burnishing of the platinum, it should be frequently annealed to keep it as soft as possible. To remove the matrix from the cavity after this final burnishing, gently tease it out with a fine exploring point, using great care so that its form may not be changed. If the cavity has been properly prepared, and there be no binding of the tooth where the platinum overlaps margins, the removal should be easily accomplished, although moisture, with the perfect contact, occasionally causes it to stick a little. Sometimes a current of air sent in at some accessible point will bring it out very nicely.—HENRY C. RAYMOND, *Dental Register.*

External Use of Salicylic Acid for Rheumatism.—According to *Revue de Thérapeutique*, November 1, 1902, Timireff, a Russian physician, has employed salicylic acid in treatment of rheumatism by external application with success. One of his formulæ consists of

Salicylic acid, $2\frac{1}{2}$ drams;
Lard, 3 ounces.

To this may be added a little turpentine, and this ointment may be put about the inflamed joints.

Or the following formula may be used:

Salicylic acid,
Turpentine,
Lanolin, āā. $2\frac{1}{2}$ drams;
Lard, 3 ounces.

According to Timireff, the acid is rapidly absorbed, irritation of the stomach is avoided, and this local application also possesses pain-relieving properties. If desired, the oil of gaultheria may be substituted for the acid, and sodium salicylate be given internally in addition.—*Therapeutic Gazette.*

Variations in Tooth-Density with Age.—That the teeth vary much in their density is shown in a variety of ways. In his daily work the close observer will have ample evidence of variations in density that obtain in the teeth of different persons, and in the same person at different periods of life. In the normal, uninterrupted growth and development of the teeth they increase in hardness up to the age of twenty-five or thirty years, and even in some instances for from five to ten years beyond this. In all cases the permanent teeth are easily cut with the excavator or drill for from five to ten years after eruption; this is true even of the better varieties of teeth. The readiness with which some fracture under percussion or blows from a hammer, or from gradual pressure as in a vise, when compared with those of firmer texture, shows a radical difference in solidity and firmness.—J. TAFT, *Dental Register.*

Preparation of the Mouth for Local Anesthesia.—I follow out in my practice the thorough rinsing of the patient's mouth with a solution of potassium permanganate prior to the performance of any operation. While it is not a pleasant preparation as a mouth-wash, I employ it because of its efficacy. It is a decided deodorant, it is a good oxidizer, and puts the mouth into as nearly a sterile condition as is possible by the use of a harmless preparation. Following this I swab the gum with absorbent cotton dipped in ninety-five per cent. alcohol. I then take a drop of carbolic acid and apply it to the point at which I intend making my puncture, so as to anesthetize as well as sterilize the point of entrance of the needle. All my instruments, including the syringe and needle, are sterilized by boiling. I most frequently employ beta-eucain, inasmuch as it can be boiled without any deterioration of the drug.—MORRIS I. SCHAMBERG, *Pacific Dental Gazette.*

Porcelain a Preserver of the Pulp.—Dr. Head spoke of porcelain as a preserver of the pulp. I could cite numerous instances in which I had complete exposure of pulps, many of them by accident, and in which the pulp was in a healthy condition. After putting in inlays there has been no further trouble. About nine months ago a young girl was brought to me who had broken one of her central incisors, leaving an exposure of the pulp. I washed the cavity out with carbolic acid and put a little temporary filling upon the tooth. The tooth was sensitive until the next appointment. I made an inlay, and knowing where the pulp was exposed, I

avoided burnishing over that spot. When the inlay was made and set she experienced no pain from the pressure, but a little from the heat of crystallization. In fifteen minutes after it was set she was entirely free from all pain, and has never had the slightest discomfort from the tooth since.—DR. REEVES, *International Dental Journal*.

Securing Dryness and Asepsis in Root-Canals.—After having applied the dam I remove all the dead pulp possible, cleanse the canal thoroughly with alcohol, then insert into it a silver broach about four inches long, letting the end of the broach protrude out of the mouth as far as it will. If there be more than one canal, put the broach into each one, and twist the other ends together, then hold the flame under the ends of the broach until the patient can bear the heat no longer. You will then have the canal both dry and aseptic. Form a paste with oil of cloves and aristol (if the paste is a day or two old it is better), then work into the canals. Should the canals not be thoroughly dry at the apex the alcohol will readily take up the moisture, also the oil of cloves, and carry the paste to the ends of the root, which will seal the apical foramen. Then insert a gutta-percha point (in small canals no point is required). This is a very aseptic filling.—G. R. GARD, *Dental Summary*.

Bacterial Action on the Pulp.—When bacteria approach near enough to the pulp the cell activity of the pulp is indicated in three changes: First, the retrogressive or degenerative; second, proliferative or regenerative; third, necrotic changes or complete death. When this last-named stage has been reached the dead or necrotic portion of the pulp becomes inhabited by bacteria, and a process of decomposition is set up, which results in the formation of certain basic substances known as ptomains. It is a pretty well established fact that many of these ptomains are physiologically inert. Briéger has called attention to the fact that oxygen is one of the necessary elements to the poisonous bases; still, on the other hand, a non-toxic ptomain is formed when freely supplied with oxygen. It has been shown that the poisonous ptomains begin to be formed at about the seventh day after putrefaction has appeared, and disappear again if putrefaction goes on.—GEO. W. COOK, *Dental Register*.

Purifying and Preserving Sheet Wax.—A good formula for sheet wax is one pound of beeswax and half a pound of paraffin, melted together, and thoroughly mixed. To

renovate the wax after it has been used, put three quarts of water in a pot, heat to the boiling-point; add to it one ounce of oxalic acid and immediately throw in the waste wax. After it is melted, allow it to boil for five or ten minutes, then set it in a place where it will cool slowly. When it is hard, the impurities can be scraped from the under surface. It is then ready to be made into sheets. To prevent the wax from being discolored by overheating, it should be melted in a double boiler. Make three or four receiving trays of common tin-plate, such as tin-smiths use, about seven inches square, with a raised edge about one-quarter of an inch high; amalgamate the surface of these trays with mercury to prevent the wax from sticking to them. Set the trays on a level surface and pour the melted wax into them quickly. With a little experience the sheet can be made just the proper thickness for use. When the wax becomes set, chill it in cold water and it is easily removed from the trays. Cut each sheet into four parts, and each part will wax up one model.—W. A. BROWNLEE, *Dominion Dental Journal*.

Germicidal Action of Alcohol, according to Charles Harrington, M.D., and Harold Walker, M.D. (*Boston Med. and Surg. Journal*, May 21, 1903). Different investigators have obtained discrepant results in their investigations of the germicidal action of alcohol. These discrepancies are due to two chief causes: First, to the use of different dilutions of alcohol; second, to the use of different kinds of organisms. The authors review the work that has been done in this field of medicine, and then report the results of their own work. They append their conclusions at the end of their article. In general it may be said—so far as regards the more common forms of pathogenic bacteria—(1) That against dry bacteria, absolute alcohol and ordinary commercial alcohol are both totally lacking in germicidal qualities. Preparations of alcohol of a strength of seventy per cent. or less do have germicidal actions. (2) Against the commoner non-sporing pathogenic bacteria, in a moist state, any dilution of alcohol above forty per cent. is effective. Dilutions of less than forty per cent. are too slow and uncertain in their action against either dry or moist bacilli. (3) The most effective dilutions of alcohol for disinfecting purposes are those containing from sixty to seventy per cent. by volume of alcohol. This is true both with regard to dry and moist organisms. Such solutions will usually kill any of the ordinary pathogenic germs in five min-

utes. (4) The bacillus anthracis is not affected by alcohol.—*New York Med. Journal*.

Care of the Mouth and Teeth in Syphilitics.—Imperfect teeth play an important rôle in the causation of lesions, especially of the tongue. The teeth should therefore be put in as perfect repair as possible, all cavities being filled, or, if they cannot be filled, the teeth being extracted. There ought not to be any sharp edges, for almost invariably they will give rise to some stubborn lesion which may resist all our efforts to cure. The blood of a person recently syphilitic being infectious, and the secretion from mucous patches of the mouth being especially virulent, the patient should be instructed to inform his dentist that he is syphilitic, so that the latter may carefully sterilize his instruments after use and take precautions to protect himself from infection. At this time, too, I am in the habit of prescribing a tooth-powder, to be used twice a day, morning and evening, made up as follows:

Potassium chlorate,	℥ss;
Powdered soap,	℥jss;
Oil of gaultheria,	q. s.

Such a powder may at times be distasteful, and I then prescribe—

Potassium chlorate,	℥j;
Water,	℥viiij.

to be used frequently through the day as a mouth-wash. These measures, together with the frequent use of the tooth-brush, will serve to keep the mouth clean and sweet, going a long way toward the prevention of lesions in the mouth, and will also prevent, to a very large degree, the salivation one is so apt to see when the mouth and teeth are unclean.—W. D. TRENWITH, *Medical News*.

The Knock-Out Blow on the Point of the Jaw.—Inasmuch as all boxing contests which terminate speedily are as a rule ended by this character of *coup de grâce*, its physiology is of great interest. A man struck with any degree of force upon the mental area of the jaw, although he may be in perfect physical condition, instantly collapses and falls to the ground. The attitude assumed in recovery, which may be instantaneous or delayed some minutes, is most characteristic. He squirms about, raises his head, and rolls his eyes in an attempt to locate himself. He tries to get on his side and elbow. He endeavors to rise upon his hands and knees. If he regains his feet he staggers like a drunken man, and should he proceed to reopen hostilities he is usually promptly "put out" by his adversary. The blow is practically never

fatal; the heart's action is never unduly accelerated, the pulse and respiration are normal, the pupils are normal; there is no headache, no sweats, no cold extremities, no pallor—none of the ordinary signs of shock or concussion. James G. Duncanson (*Brit. Med. Journal*, April 4, 1903) believes the condition to be due entirely to a shaking up of the endolymph in the semicircular canals. When the blow is administered there is a violent over-twisting of the head, which is held in its antero-posterior position by muscles which, compared with those inflicting the blow, are small and puny. The result is that the head flies around with a jerk and the fluid in the canals is subjected to a greater disturbance than by any other trauma. There is little reason to doubt that this is the interesting pathology of the well-known but little understood *coup de grâce*.—*Medical News*.

How to Make Hypodermic Injections of Cocain.—Use a good, strong hypodermic syringe with heavy finger-pieces, short needle, reinforced and with very short point. Absolute cleanliness of the syringe must be observed in all cases. Saturate a small piece of absorbent cotton with the obtundent and apply at the point where the first insertion of the needle is to be made. You can use a stronger solution of cocain for this purpose if you prefer. Draw the syringe full, invert it, and by gentle pressure on the piston drive out the air. Insert the needle just far enough to cover the opening in the point; press the piston gently, and as the parts whiten increase the pressure on both needle and piston. Should the muscular tissue be pierced and cause the gum at the apex of the root to puff, keep the needle in place and rub the finger over the puffed surface to spread the fluid. The next insertion should be made near the outer edge of the affected tissue, which by this time has a white appearance. Then repeat the operation until the buccal or labial portion is fully affected. Then pass the needle through the soft tissue between the teeth at the neck, pressing the piston gently, that the effect of the obtundent may be felt in advance of the needle. When the palatal portion is reached, proceed to inject there thoroughly, from neck to apex. In about two minutes extraction can be made, or, where several teeth are to be extracted, by the time four or five are prepared the first will be ready.—WM. TAYLOR WYCKOFF, *Pacific Dental Gazette*.

X Rays in Therapeutics.—The results from the use of the X rays in his practice

have been so gratifying to Harris (*Australasian Med. Gazette*, Sept. 20, 1902) that he predicts a more general use of this therapeutic agent in the treatment of many indolent forms of skin disease. After experimenting on a number of cases he has formed the following conclusions as to its effects:

Lupus erythematosus. The two most common forms in which this disease occurs are the erythematous and sebaceous varieties. Of these the former is the more difficult to deal with, and a long time is required for treatment; and it is questionable even then whether improvement results. The sebaceous form rapidly responds to treatment; as a rule, twenty to thirty sittings suffice. Occasionally a reaction occurs, producing inflammation of the part under treatment; if due care be not exercised this might even produce alarming effects. It is not essential that any reaction should be produced to effect a cure, for of nine cases of lupus treated thus, five suffered no reaction. The results have been very satisfactory with the exception of the first case, in which there was produced an excessive reaction, and as a consequence the patient did not report herself again for further treatment. One case of the erythematous variety under care at time of reporting was progressing only moderately.

Rodent ulcer. This was in a man aged sixty-four, and involved the end of the nose. It was of several years' standing, and had been once scraped. This case rapidly responded to treatment, and after thirty-two sittings appeared to be quite healed.

Hypertrichosis. The hairs in the several cases tried fell out after fifteen to thirty sittings, but soon reappeared. In one case the treatment was continued, on and off, for seven months, but finally it was given up in despair. The hairs were removed effectively by electrolysis.

Keloid and hypertrophied scar tissue. In one case where hypertrophied scar tissue formed after an operation for tubercular glands of the neck, this was removed after three months' intermittent treatment with the rays.—*Therapeutic Gazette*.

An Amalgam Automaton.—Dr. G. V. Wunscheim (*Oest.-ungarische Vierteljahrschrift*), after calling attention to the waste of amalgam by the common practice of preparing an uncertain quantity, usually more than required, and to the uncertain composition owing to an excess of mercury having been added, the surplus being then squeezed out, proceeds to describe a little apparatus he has had made with the object of meeting these difficulties. In a metal cylinder a thick rod, turned by a handle, revolves. Through the cylinder and the rod two vertical parallel holes are drilled, opening below over a funnel conducting to a mortar, and above having fixed over them, and continuous with them, two glass receivers covered by a screw-on lid. The sides of the holes in the rod have a thread cut on them, and a disk of metal, threaded, is screwed into the bottom of the holes, forming to them a movable floor and so enabling the amount they can contain to be varied within limits by screwing the disk in or out. In one glass receptacle are placed the filings of the alloy, in the other the mercury. When the handle is turned upward the filings and mercury pass respectively into the two chambers in the rod closed below by the disk; then the handle is turned half a circle, the rod revolves, the disks are turned upward, acting as stoppers to the glass receivers, and the contents of the chambers in the rod pass downward through the hole in the bottom of the cylinder into the funnel and so to the mortar. In use the exact relative amount of filings and mercury are found by experiment, and the size of the chamber in the rods is fixed to contain these amounts by screwing the disks up or down the holes in the cylinder. These conditions being determined for a given amalgam the exact quantities required are discharged into the mortar at each revolution of the handle. The author claims the following advantages: Since he has used it he has had no waste; there is saving of time; the amalgam is always of equal quality, the conditions being present to insure the best result for a given amalgam.—*Brit. Dental Journal*.

HINTS, QUERIES, AND COMMENTS.

A PECULIAR CASE OF ROOT-RESORPTION.

THERE are cases of root-resorption which, as has been observed by dental pathologists, do not exhibit any tangible cause, and the illustration here shown is perhaps an example of this variety of root-disorders. This specimen was obtained by Dr. J. S. Spurgeon, Hillsboro, N. C., to whom we are likewise indebted for the history of the case, which,



however, does not include any data of diagnostic value. The mouth from which the tooth was extracted does not exhibit any abnormalities; the mucous membrane is apparently in perfect health and the patient could not remember having ever suffered from any disease whatever.

HEREDITARY GEMINATION OR TOOTH-FUSION.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I am mailing you under separate cover models of two mouths, one of an adult (myself) twenty-eight years of age, and one of a child (my boy) aged two years and three months. These models do not alone present irregularities, but that very important factor that plays so considerable a part in our profession—*heredity*.

When I was a child I remember that our family dentist offered me quite a nice price, as I thought, for my little "double tooth" if I would keep it for him when it was displaced by its permanent fellow, but of course the tooth was lost, or I suppose so, for I knew nothing nor thought any more about it until I began the study of dentistry and discovered

that although all my wisdom teeth had erupted, I was minus one tooth in the lower denture, having only three incisors. (Fig. 1.)

FIG. 1.



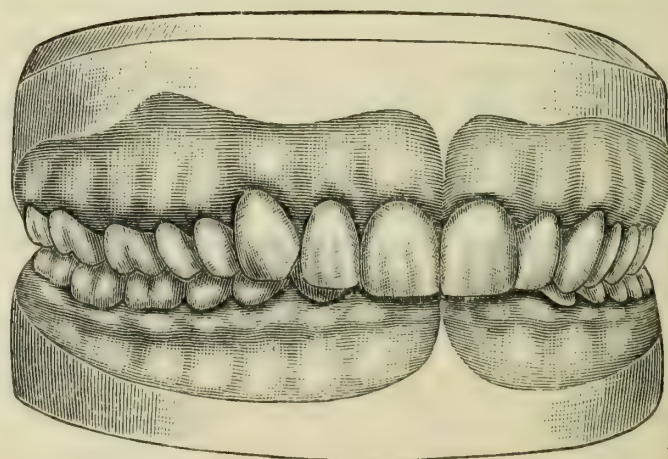
You will note in the child's model (Fig. 2) that the lower right canine and the lateral

FIG. 2.



incisor have fused; so that, at the time of the eruption of the permanent set, Nature

FIG. 3.



only gave me one tooth in place of the fused lateral and canine. This of course caused a constriction of the lower arch, and a malocclusion resulted. As you will notice from

the bite I send you (Fig. 3), the cutting edges of the lower anterior teeth pass up on the lingual aspects of the upper six anterior teeth, to the gingiva, impinging the rugæ. When there is any irritation at all in the roof of the mouth the closing of the teeth makes it exceedingly painful. Now, through the medium of your valuable journal I would

like to have expressions from you and the profession at large as to what means, if any, can be employed to correct the irregularity in myself, and to prevent such a constriction of the lower arch as will inevitably take place in the child.

Yours truly,

W. C. MILLER.

OBITUARY.

DR. HORACE C. SMITH.

DIED, May 3, 1903, at his home, Athol, Mass., Dr. HORACE C. SMITH, at the age of sixty-six years.

Dr. Smith was born in Cooperstown, New York, in 1837. At the age of twenty-four he entered upon the study of dentistry in the office of Dr. Robinson of Watertown, New York, where he remained for over a year. In 1861 he opened an office in Athol, Mass., and here for forty-two years he continued the practice of his profession.

Dr. Smith was prominent in the social life of his native town because of his cheerful disposition, accomplished manners, and charitable inclinations. He was exceedingly popular, not only among his patients but also outside of his professional relations, and wherever known he held the respect and affection of all.

Dr. Smith was a champion of sound dentistry, always doing everything within his power to raise the standard of his profession to the highest level, deserving in this respect also the appreciation and gratitude of all those who are laboring for the attainment of the same good purpose.

DR. OTTO ARNOLD.

RESOLUTIONS OF REGRET ADOPTED BY THE DENTAL SOCIETY OF COLUMBUS, OHIO.

WHEREAS, Death has again visited us and has taken from us our friend and brother, Dr. OTTO ARNOLD; and

WHEREAS, With his death the profession at large has lost one of its prominent and earnest advocates, whose presence was known in all its gatherings from the least to the greatest; and

WHEREAS, In him we have ever found a member active in the interests of this society, whose face and whose words were always gladly welcomed; therefore, be it

Resolved, That we, the Columbus Dental Society, while of necessity yielding to the inevitable, deeply deplore his death, and earnestly unite with the bereaved wife and daughter in mourning his untimely loss, and shall ever bear in kindest recollection the memory of our past association with him.

Resolved, That a copy of these resolutions be sent to the bereaved family, that a record be made in the transactions of the society, and copies be sent to the dental journals.

A. O. ROSS,

F. R. CHAPMAN,

J. B. BEAUMAN,

Committee.

SOCIETY NOTES AND ANNOUNCEMENTS.

NORTHERN INDIANA DENTAL SOCIETY.

THE Northern Indiana Dental Society will hold its annual meeting at Wabash, Indiana, September 15 and 16, 1903.

J. A. STOECKLEY, *Sec'y*, South Bend, Ind.

Department of the State University, Minneapolis, Minn. All dentists are cordially invited to attend.

GEO. S. TODD, *Sec'y*, Lake City, Minn.

MINNESOTA STATE DENTAL ASSOCIATION.

THE twentieth annual meeting of the Minnesota State Dental Association will be held on Tuesday, Wednesday, and Thursday, September 1, 2, and 3, 1903, at the Dental

NORTHERN IOWA DENTAL ASSOCIATION.

THE ninth annual meeting of the Northern Iowa Dental Society will be held at Clear Lake, Iowa, September 1, 2, and 3, 1903.

An interesting program is now assured.

C. L. TOPLIFF, *Sec'y*, Decorah, Iowa.

DENTAL COLLEGE COMMENCEMENTS.

DES MOINES COLLEGE OF DENTAL SURGERY.

THE annual commencement exercises of the Des Moines College of Dental Surgery were held on Friday, May 1, 1903, in Drake University Auditorium, Des Moines, Iowa.

An address was delivered by Judge McPherson, and the valedictorian was J. H. McGuire.

The degree of D.D.S. was conferred by the president, Hill M. Bell, on the following graduates:

Charles Everett Anderson.
Edward Moore Aiken.
Norman James Bates.
Benjamin M. Brookfield.
Matthew Archie Conant.
Morton Egbert.
Roy Colwell Frush.

Joseph Russell Gary.
Edgar Robert Gladson.
Robert Allen Homes.
Frederick George Kell.
Earl Lesslie Kizer.
Henry Gerhard Leikvold.

Clyde H. McConaughy.
John Henry McGuire.
Wellington Wood Neuman.
Arthur Nelson Reed.
Amon Moses Slatten.
Emery Arthur Witmer.

HARVARD UNIVERSITY DENTAL SCHOOL.

THE commencement exercises of the Dental Department of Harvard University were held on Wednesday, June 24, 1903, in Saunders Theater, Cambridge, New York.

President Eliot conferred the degree of D.D.S. on the following graduates:

Paul Christen.
Harold William Clarke.
Bernhard Cohen.
Henry Eli Cohen.
Ralph Prindall Cunningham.
Stanley William Damon.
John Boynton Davis.
Martin Bassett Dill, A.B.
Ernest Hubbell Gilbert, A.B.

Henry Gilman, A.B.
Harold Clinton Hanlon.
William Dimick Hazen.
Herbert Frank Langley.
Albert Thompson McMurray.
Edward O'Connor.
Charles Henry Patton.
Austin Hall Parker.
Frederick Capen Peterson.

Mark Bailey Pressey.
Frank Packard Simpson.
Harry Austin Stone.
Frank Edgar Travis.
William Harry Weston.
Aubrey Albuoy Williams.
Clinton Nickerson Williams.
Thomas W. L. Wilson, M.A.C.D.
George Henry Wright.

WESTERN RESERVE UNIVERSITY, COLLEGE OF DENTISTRY.

THE annual commencement exercises of the College of Dentistry of Western Reserve University were held June 18, 1903, at 10.30 A.M., in the Beckwith Memorial Church, Cleveland, Ohio.

President Charles F. Thwing conferred the degree of D.D.S. upon the following graduates:

Charles Christian Bachman.	Dwight Charles Hahn.	Robert Hartley Ralston.
Arthur Andrew Bates.	Edson Hill.	Henry Stephen Rogers.
Will Deville Bissell.	Willis K. Hoch.	Frank Garfield Rummel.
Leroy Needham Bundy.	Edward John Koemit.	Joseph Elmer Schultz.
John William Culver.	Bertram Ward Livingston.	Orrin Franklin Sickman.
Harry Guy Decker.	Harrison Deming Lowrey.	Arthur Albert Smith, M.D.
Walter Hayes Dewey.	Isidor Lymon.	Herman Leiter Smith.
George William Douthiel.	Clarence Elworthy Magee.	Howard Clinton Standen.
Gerald Felix Doyle.	Frank Sumner Manchester.	Clarence Roy Thompson.
Frank Arthur Dunn.	Lloyd Andrew Mapes.	Robert Lee Wilson.
Phillip Henry Felger.	Ralph Edward Miller.	John Simon Windisch, M.D.
Joseph Garold Foltz.	Kennedy Delyle Park.	Kirkum Glenn Worrell.
Albert Kenyon Friend.	Edward Lacey Pettibone.	Newton John Worley.
Albert Lorain Griffis.		

TUFTS COLLEGE, DENTAL DEPARTMENT.

THE forty-seventh annual commencement exercises of the Dental Department of Tufts College, Boston, Mass., were held on June 17, 1903.

The degree of D.D.S. was conferred on the following graduates:

Harry Prescott Allen.	Harry Myers Gokey.	Clarence A. Pettengill, B.S.
Carrie Isabelle Hough Bence.	Thomas Frederick Grogan.	Francis Xavier Quinn.
Boyd Franklin Bowles.	Henry Taylor Harpin.	Sidney Burt Sargent.
William Lowell Cargill.	Leslie Woodbury Harris.	George Maurice Shaw.
George William Carpenter.	Grace Maude Hough.	Joseph William Shay.
Charles Redman Cole.	Robert Crawford Jamieson.	James Henry Shillington.
Joseph Reynolds Dixon.	Varney Albert Kelley.	Harry Manoog Shooshan.
John Henry Dooley.	Francis Jesse Lanigan.	Frank Wells Sproul.
Arthur William Doubleday.	James Lawton.	Odber Welsley Staples.
William Snow Dow.	Anthony J. T. Lima.	Joseph Snow Stetson.
Harry Alexander Draffin.	Burt Eugene Logwood.	Howard Lester Thorburn.
Oliver Kendall P. Durgin.	George Edward Mahoney.	Edward William Tobin.
Edward Fall.	Walter Courtlandt Mason.	Harold Smith Viles.
Robert Farquhar, Jr.	Frank Bruce Miles.	Winfred Francis Wescott.
Curtis William Farrington.	James O'Brien, Jr.	Morse Wightman.
Frank Joseph Gilday.	Irving Erskine Pendleton.	John Joseph Wren.

NEW YORK DENTAL SCHOOL.

THE tenth annual commencement exercises of the New York Dental School (University of the State of New York) were held at the Academy of Medicine, New York city, on Monday, May 4, 1903.

The address to the graduates was delivered by Rev. Joachim Elmendorf, D.D.

The degree of D.D.S. was conferred on the following graduates:

Anna Bella Bauerberg.....	Russia.	E. C. McCulloch.....	New York.
George D. Conkling.....	New York.	Stephen McCulloch	New York.
Harry Mott Demarest.....	New York.	Fanny H. Rabin.....	Russia.
Benjamin Gortikev.....	Russia.	Fannie Rosencrantz	Russia.
Lizzie Horowitz.....	Russia.	Louis Sabloff	Russia.
Harry A. Kuhl.....	New Jersey.	William Steinbuch	New York.

KEOKUK DENTAL COLLEGE.

THE annual commencement exercises of the Keokuk Dental College were held in the Keokuk Opera House, Keokuk, Iowa, Tuesday, April 28, 1903.

The doctorate address was delivered by J. B. Monfort, D.D.S., and the valedictory by Chas. L. Tompkins, D.D.S.

The degree of D.D.S. was conferred by Prof. Geo. F. Jenkins, A.M., M.D., on the following graduates:

J. Milton Anderson.....	Iowa.	John Stephen Mayes.....	Missouri.
C. Randolph Bankhead.....	Missouri.	George Montgomery Palmer...	Minnesota.
Perry Franklin Crawford.....	Missouri.	Chris P. Peterson.....	Iowa.
Edward E. Courtright.....	Iowa.	Fred B. Smales.....	Iowa.
William C. Hastings.....	Iowa.	Edward Elwell Stewart.....	Iowa.
Thomas Albert Hays.....	Missouri.	David Woodson Taylor.....	Illinois.
Edward O. Hile.....	Missouri.	Charles L. Tompkins.....	North Dakota.
Florence Amelia Howard.....	Illinois.	Lloyd E. Warder.....	Illinois.
Jesse F. Keeney.....	Illinois.	David Z. Wylde.....	Illinois.
Victor V. Mason.....	Wisconsin.		

SAN FRANCISCO DENTAL COLLEGE.

THE twenty-fifth annual commencement exercises of the San Francisco Dental College were held at the Academy of Sciences, San Francisco, on Wednesday, June 17, 1903.

An address was delivered by Rev. Frank K. Baker.

The degree of D.D.S. was conferred by the president, D. Maclean, M.D., on the following graduates:

Arthur C. Hicks.	C. Edward McCafferty.	Arthur W. Minaker.	Jesse C. Perry.
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UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JUNE 1903.

<i>June 2.</i>		No. 731,302, to JOHN C. HOLSON. Attachment for dental engines.	
No. 729,621, to IRA MALONE. Dental suction plate.		No. 731,337, to CALVIN S. CASE. Dental pliers.	
No. 730,038, to DANIEL MURLLESS. Dental dam holder.		<i>June 23.</i>	
No. 730,040, to H. C. MCKINLEY and ALBERT DIEGEL. Fountain tooth-brush.		No. 731,586, to FRANCIS S. MANNING. Upper-cuspid forceps.	
No. 730,128, to JAMES B. JORDAN. Saliva-ejector.		No. 731,594, to WILLIAM H. MOSLEY. Porcelain crown for teeth.	
No. 730,184, to EZRA W. WITTER. Dental appliance.		No. 731,674, to HARRY L. FINNELL. Dental plate and process of making same.	
<i>June 9.</i>		No. 731,849, to ABRAM L. BOWER. Dental preparation for use in the operation of capping pulps.	
No. 730,379, to JOSEPH LETORD, WM. W. ALEXANDER, and HENRI LETORD. Circuit controlling for surgico-dental engines.		No. 731,910, to ELMER JOHNSON. Blowpipe.	
No. 730,658, to DAVID T. HUBER. Dental bite-taker.		No. 731,973, to CHAS. K. TETER. Nasal inhaler.	
No. 730,714, to PAUL H. STEHLEY and JAMES H. HULLINGS. Pneumatic apparatus for dentists or physicians.		<i>June 30.</i>	
<i>June 16.</i>		No. 732,044, to ALDEN BUSH. Dental plugger.	
No. 731,030, to WILLIAM FINN. Dental flask press.		No. 732,288, to KUNO FELSCH. Dental forceps.	
No. 731,246, to JOHN V. TRENAMAN. Fountain cuspidor.		No. 732,386, to JULIUS B. WANTZ. Friction-gear for electric motors.	
		No. 732,387, to JULIUS B. WANTZ. Dental engine.	
		No. 732,662, to GEORGE B. SMITH. Dental medicine receptacle.	

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No. 9.

ORIGINAL COMMUNICATIONS.

FURTHER EXPERIMENTS RELATING TO THE QUESTION OF IMMUNITY.

By W. D. MILLER, D.D.S., M.D., Ph.D., Sc.D., Berlin.

(See preceding articles on this subject in the January and February issues of the Cosmos.)

THE following conclusions are to be drawn from the results of the experiments published in the January and February issues of the DENTAL COSMOS:

1. The mixed human saliva—whether filtered or unfiltered, in its normal state or condensed by evaporation over the water-bath or at the temperature of the human body—does not possess the power to prevent or retard processes of fermentation and putrefaction.

2. The potassium sulfocyanid does not possess any appreciable antiseptic action in the greatest strength in which it is found in the human mouth.

3. Growths of bacteria and fermentative and putrefactive processes take place in oral mucus quite as readily, if not more so, than in the mixed saliva of the same persons.

4. The saliva of immunes develops in the presence of carbohydrates, on an average, a little less acid than that of highly susceptible persons. The difference is, however, not constant, and not sufficiently marked to account for the marked differences of susceptibility.

5. The protective bodies (alexins) of the blood do not, under normal conditions, pass into the saliva in sufficient quantity to be detected by ordinary means.

6. Free acids produced by fermentation make their appearance in strongly alkaline saliva (horse) much later than in human saliva.

7. The struggle for existence probably performs an important rôle in protecting the mouth and the organism in general against the invasion of pathogenic micro-organisms.

To these we may add—

8. Bacterial plaques are essential neither to the beginning nor to the progress of caries, nor does their presence necessarily result in the production of caries. It is possible that they may intensify processes of decomposition in particles of food clinging to the surfaces of the teeth.

In the present communication I propose to continue the discussion of the problem, beginning with the following question:

QUESTION—*Does the human saliva possess globulicidal or hemolytic action?*

In order to leave no means untried that might bring to light the bacterial properties of saliva, if such properties should be found to exist, I made a series of tests for determining its globulicidal properties; that is, its power of dissolving red blood corpuscles. It is very generally known that the operation formerly frequently practised of introducing the blood of animals (lamb) into the circulation of human beings has been abandoned, as it was found that among other deleterious effects it brought about a dissolution of the red blood corpuscles of the blood introduced as well as of that of the person under treatment. It has furthermore been ascertained that the blood serum of any animal possesses the power of dissolving the red blood corpuscles of man or of other animals as well *in vivo* as *in vitro*. The dissolving power of the blood serum may be indefinitely increased by a preliminary treatment of one animal, by injecting the blood serum of another. The increase of the globulicidal properties of the blood serum manifests itself, however, only toward the blood corpuscles of the animal which furnished the serum.

We see accordingly that a process takes place which has the greatest similarity to that which is observed when an animal is immunized against a certain kind of bacterium, and the substances which in the one case produce the immunity and in the other dissolve the red blood corpuscles have the greatest similarity—and, in fact, by Bordet and others are considered identical. Accordingly, very much of the knowledge which we now possess regarding the question of immunity is based more upon experiments with hemolytic than upon those with bactericidal sera. It seemed to me, therefore, that some light might be thrown upon the question of the much-sought-for immunizing properties of saliva by experiments upon its hemolytic properties. Those experiments were carried out in the following manner:

The blood of a rabbit was collected

directly from the jugular vein in a Florence flask containing some fifty sterilized glass beads, and defibrinated by briskly shaking. The defibrinated blood was then poured off and the red blood corpuscles separated by centrifugating. Five small drops of the red blood corpuscles were brought into each of a number of sterilized test tubes and 2 to 5 c.cm. of the liquid of which the hemolytic action was to be tested added. Unless the red blood corpuscles were dissolved at once the tubes were placed in incubator for two hours, the tubes being shaken from time to time whenever the corpuscles were seen to have accumulated at the bottom. At the end of this time they were placed on ice or in a very cold place for some hours, or over night. A solution of the red blood corpuscles is then indicated by a more or less pronounced red coloration of the serum, amounting to a cherry red color where a total solution has taken place.

The following substances (mostly constituents of the saliva) were tested, with the results indicated:

Solution of Red Blood Corpuscles.

Fresh saliva.....	Immediate total solution		
Old "	" " "	"	"
Filtered "	" " "	"	"
Saliva heated to 60° C.	" " "	"	"
" boiled.....	" " "	"	"
Fountain water.....	" " "	"	"
Distilled "	" " "	"	"
Ammonium chlorid,			
1:1000	" " "	"	"
Potassium chlorid,			
1:1000	" " "	"	"
Sodium chlorid,			
1:1000	" " "	"	"
Sodium sulfate,			
1:1000	" " "	"	"
Potassium sulfocyanid.....	1:1000	"	"
Sodium glycocholate			
(all concentrations)	" " "	"	"
Sodium taurocholate			
(all concentrations)	" " "	"	"
Sodium cholate			
(all concentrations)	" " "	"	"
Potassium sulfocyanid, 1:100...	No	"	"
Sodium chlorid, 1:100.....	"	"	"
Ammonium chlorid, 1:100...	Slight	"	"
Pepsin	No	"	"
Trypsin	Trace of	"	"
Ptyalin	Slight	"	"
Urine	No	"	"

We see that the human saliva dissolves the red blood corpuscles of the rabbit under all conditions, as do also attenuated solutions of various salts of the saliva. It has been accordingly suggested that the hemolytic action of the saliva is due to the presence of certain salts. We see, however, that water also effects a complete and rapid solution of the red blood corpuscles, whereas no solution takes place in more concentrated solutions of the salts. Most salts, instead of dissolving the red blood corpuscles, prevent their solution, and it is probably owing to this fact that the red blood corpuscles are not dissolved in their own serum. Urine, which is a non-solvent, becomes a solvent for red blood corpuscles when it is diluted or the salts are removed by dialysis.

The pronounced hemolytic action of the saliva is accordingly due only to its water, and not to its salts or to any substance analogous to the alexins of the blood; since in this latter case boiling the saliva, or even heating it to 60° C. for half an hour, would destroy the hemolytic power—which, as has been shown above, is not the case. In order, therefore, to determine whether the saliva really possesses any hemolytic bodies analogous to those of the blood, we must first eliminate the solvent action of the water. This is done by adding a sufficient quantity of sodium chlorid to bring the tension of the saliva up to that of the blood, or about 0.75 per cent.

Saliva to which 0.75 per cent. of sodium chlorid had been added was found to have lost its hemolytic action almost completely, merely a slight solution occasionally taking place, which may be readily accounted for by the presence of ptyalin.

These experiments must accordingly also be said to have resulted negatively.

We come now to the next question:

QUESTION—*What rôle does phagocytosis play in the human mouth?*

In the ordinary processes of fermentation with their accompanying phenomena, in particular in caries of the teeth, the action of phagocytes scarcely

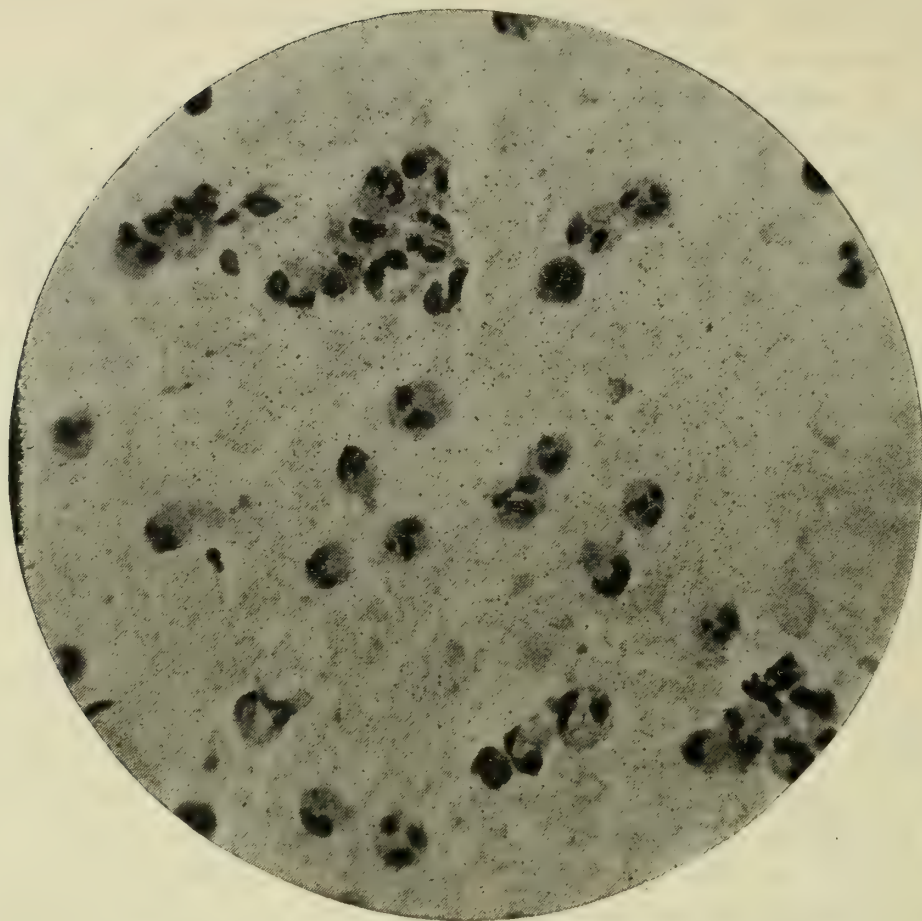
comes into consideration, whereas in affections of the soft tissues of the mouth it may play a very important rôle. Hugenschmidt, working in the laboratory of Metchnikoff, obtained results which indicate that the saliva possesses positive chemiotactic properties. When capillary glass tubes, closed at one end, were filled with saliva and introduced under the skin, or into the abdominal cavity of rabbits, guinea-pigs, etc., the open end became closed by a dense plug of phagocytes inside of three hours, from which Hugenschmidt infers that in case of open wounds in the mouth phagocytes must be attracted in great numbers by the saliva or by the bacteria which it contains. I have found also that the secretions of wounds produced by the extraction of teeth examined three to four hours after operation contain vast numbers of leucocytes, and that in many cases they are loaded down with bacteria, and must consequently greatly assist in keeping the wounds free from infection. (See Figs. 1 and 2.)

QUESTION—*Does the human saliva manifest any antiseptic action toward pathogenic bacteria?*

In my experiments relating to this question I tested the action of my own saliva upon the micrococcus of sputum septicemia (*Diplococcus pneumoniae*). I chose to experiment with my own saliva because I have not been able to find the pneumococcus in it for the past few years, from which the inference is to be made that it is, in more than the usual degree, inimical to this micro-organism; and if the human saliva possesses any bactericidal action whatever upon the micrococcus of sputum septicemia (pneumococcus) we should be able to detect it in my saliva with comparative ease.

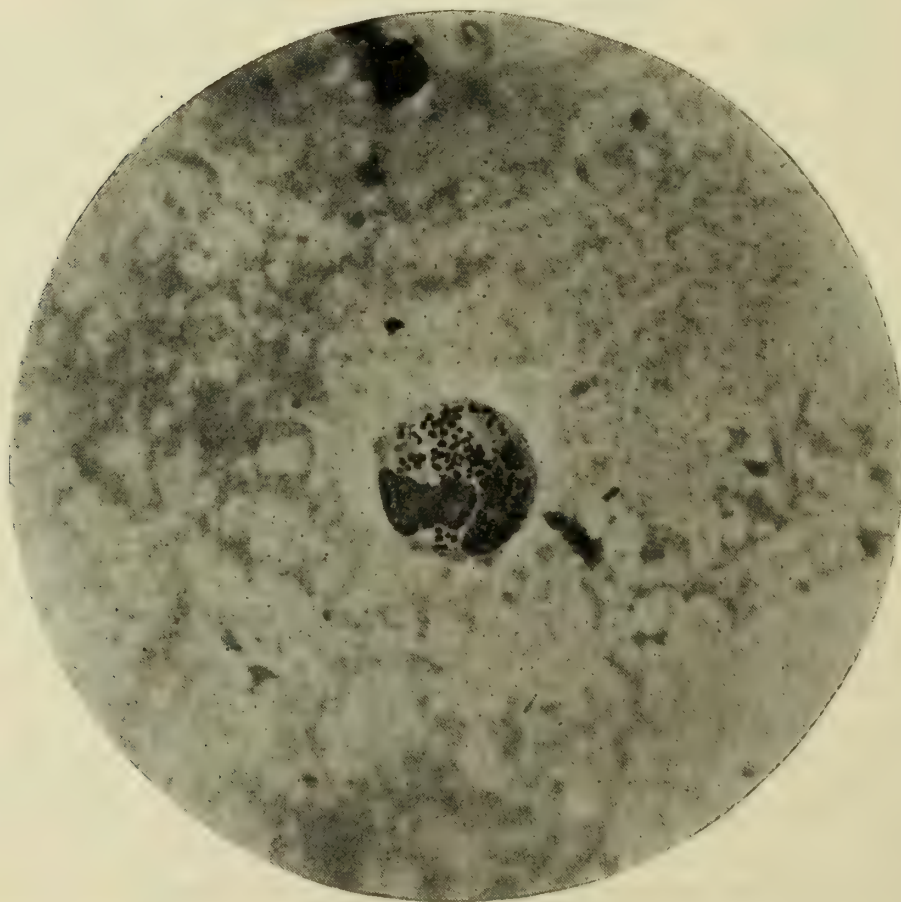
The experiment was carried out in the following manner: Two watch-glasses were filled, the one with 1 c.cm. of saliva which had been passed through two layers of ordinary filter paper, the other with 1 c.cm. of sterilized water. The contents of both glasses were then infected with three to four loops of blood from the heart of a mouse which had

FIG. 1.



Accumulation of phagocytes in the wound three hours after tooth-extraction. (300:1.)

FIG. 2.



A single phagocyte loaded with bacteria, from the wound four hours after tooth-extraction. (1000:1.)

died but a short time before of sputum septicemia. Both vessels were allowed to stand for two to three hours, and then mice infected subcutaneously with 0.2-0.3 c.cm. of the contents. Supposing the saliva to have a deleterious effect upon the micro-organisms (to destroy a certain number of them or to attenuate their virulence), then the animals infected from the watch-glass containing saliva should live longer than those infected with the micro-organisms which had been subjected only to the action of the water. In fourteen cases out of twenty-one the mice infected with pneumococci in saliva died sooner, in two cases at the same time, and in five cases later than those infected with pneumococci in water.

From these results we can only conclude that the pneumococci retain their virulence in saliva at least as well as, if not better than, in water.

The results thus far obtained from my investigations seem to justify the conclusion that *the protective powers present in the human mouth are not to be accounted for by any antiseptic action on the part of the saliva, but rather by the phenomenon of phagocytosis, by the struggle for existence, and probably by certain forces residing in the soft tissues which have not yet been investigated.*

The question of the different susceptibilities of different teeth to caries still remains an unsolved problem, upon which I hope that experiments now under way may throw some light.

COMPARATIVE NUMBERS OF BACTERIA IN DIFFERENT MOUTHS.

The idea has been very naturally suggested that the conditions in different mouths may be favorable or unfavorable in different degrees to the development of bacteria; that in the one we may have few compared with the other, and that the difference in the amount of caries may be explained thereby. I have made a few experiments relating to this question with the following results:

Patient.	No. of bacteria to loop of saliva.	Average.
1. Immune, clear saliva	56,650	64,987
2. " " " "	93,000	
3. " " " "	95,000	
4. " " " "	15,300	
5. Slight caries, clear saliva	17,850	33,975
6. " " " " " "	50,100	
7. Moderate " " " "	36,400	61,870
8. " " " " " "	30,950	
9. " " " " " "	92,000	
10. " " " " " "	95,000	
11. " " " " " "	55,000	
12. " " " mucus and sediment.	205,000	
13. Highly susceptible, clear saliva	44,000	56,333
14. Highly susceptible, clear saliva	84,000	
15. Highly susceptible, clear saliva	41,000	

These results give little or no clue to a solution of the question, and only show that a very large number of experiments must be made in order to arrive at any conclusion. I would advise a comparison of immunes with the highly susceptible only. On getting up in the morning, the teeth having been carefully cleaned the night before, the persons under examination should thoroughly rinse the mouth with sterilized water, using the same amount and carrying out the process in exactly the same way as nearly as possible. The rinsing-water should then be diluted with a liter of sterilized water, thoroughly shaken to distribute the bacteria equally, and then at least five different loops taken and five different agar plates made. The experiment might be varied in many ways which will suggest themselves to the experimenter, and I hope that someone will undertake the task, as I fear I shall not have the time for it. A very large number of experiments would be necessary in order to arrive at definite results.

EXPERIMENTS IN THE MOUTH.

In continuation of the experiments reported already in the February number of this journal, I caused capsules of celluloid to be constructed of about the shape and size shown in the accompanying figure. They were perforated by

twenty-two small holes, filled with bread and tied to the teeth on going to bed. The reaction in the morning was found to be strongly acid, and—as far as could

FIG. 3.



be determined by the litmus test—as much so in the case of an immune (Dr. York) as in my own case, who am of an average susceptibility.

RELATION OF THE QUALITY OF SALIVA TO SUSCEPTIBILITY.

The opinion is very prevalent that a viscid, stringy saliva is conducive to caries, which is probably the case in so far as the self-cleansing process in the mouth is impaired by it.

For some time I have paid attention to this question and have met with a number of cases of total immunity to caries in connection with very stringy saliva. Two Chinamen whom I recently examined were found to be quite immune but to have extremely viscid saliva; in the one case so much so that it was not possible to pour a portion from one vessel to another, the whole of it dragging over like the white of an egg. Nor are these isolated cases. Again, I have met with many cases of extensive destruction of the teeth by caries in connection with very thin saliva. I am consequently inclined to the belief that on the whole the action of the viscosity of the saliva in the causation of dental caries has been somewhat overrated.

THE RELATION OF THE QUANTITY OF SALIVA TO THE QUESTION OF SUSCEPTIBILITY.

Undoubtedly a strong flow of saliva tends to a certain extent, except in deep cavities to which it scarcely penetrates, to dilute the acids produced by fermentation in the mouth, to wash away small

particles of food, and to prevent their adhering to the surfaces of the teeth. How much this may be the case is exemplified by the following: A colleague applied to me for advice in the case of a patient who up to within a year or two had fairly good teeth. Recently, however, the teeth began decaying in a frightful manner, especially at the necks and along the free margins of fillings, where caries as a rule seldom occurs. The patient came to me in order that I might examine her saliva, and I gave her the usual ball of cotton to chew upon. After a futile attempt which was kept up for at least five minutes we gave up, having secured only a few bits of foam. On inquiring I found that the patient suffered continually from excessive dryness in the mouth and throat and had great difficulty in swallowing. We have here a sufficient explanation for the rapid progress of caries; all acids produced by fermentation not being diluted by saliva, and acting in full strength even on exposed surfaces.

The protective action of a free flow of saliva will manifest itself most on the free surfaces of the teeth, much less in deep cavities or spaces which are packed with food, and of course not at all during periods when the secretion of the saliva ceases altogether, especially in sleep. It is consequently a factor which should not be overlooked, but hardly one of primary importance except where the deficiency in the quantity of saliva secreted is very marked, approaching the condition cited above. The amount of saliva which a patient secretes during a dental operation is not necessarily a measure of the normal secreting capacity of that patient. A case similar to the above was reported by M. Rigolet in *Odontologie* for April 30, 1901.

FERMENTABLE CARBOHYDRATES IN SOLUTION IN THE SALIVA AS A CAUSE OF CARIES.

Fermentable carbohydrates are undoubtedly to be found in the saliva after every meal unless the teeth be very thoroughly cleansed immediately after eating or before making the test. Anyone may

convince himself of this fact by the following simple experiment. Eat a piece of bread allowing as much as possible to remain sticking to the teeth. About an hour later eject 5 c.c. of saliva and filter. The filtrate if kept at the temperature of the body will be found to have taken on a pronounced acid reaction in from twelve to fifteen hours, proving that carbohydrates must have been in the saliva in a state of solution. Aside from this, however, it has been pointed out, especially by Salomon, Michaels, Kirk, and others, that the saliva in certain cases contains a substance which responds to Von Jaksch's test for glycogen, although this test does not allow us to differentiate with certainty between glycogen, a product of food metabolism poured into the mouth by the salivary glands, and erythrodextrin, a product of food digestion in the mouth itself. To settle this question it would be necessary to test the saliva directly as it comes from the glands.

On this question Kirk (*Dental Summary*, February 1903) writes as follows: "The presence of glycogen in the saliva at times is highly probable, though in the absence of a more characteristic test for that compound in the presence of erythrodextrin its presence in the mixed saliva cannot be taken as finally demonstrated. It would doubtless be possible to determine the question with sufficient accuracy by an examination of the saliva taken directly from the glands and before any contact with carbohydrate food débris in the mouth cavity was possible. That I have not as yet done, owing to the necessity for special arrangements for that line of work which I am not at present ready to take up. Certain physical characteristics of the saliva—its opalescence, for example—suggest in some cases the presence of glycogen, a suggestion further intensified by the chemical test referred to; and the strong probability that the predisposition to dental caries is correlated with and dependent upon a diathetic state makes it appear not at all unlikely that some fermentable carbohydrate substance, such as glycogen, the product of food meta-

bolism is constantly dialyzed from the blood plasma into the mouth through the medium of the glandular apparatus of the buccal cavity in cases of marked susceptibility to dental caries."

If the saliva as it flows from the ducts contained enough glycogen to appreciably affect the course of caries by undergoing an acid fermentation in the mouth, then it would be a simple matter to establish its presence experimentally. The person whose saliva is to be examined would need only to rinse his mouth very thoroughly and then eject some 5-10 c.c. of saliva, which should be filtered and placed in the incubator. If glycogen be present in any quantity which could affect the course of dental caries the saliva will show an acid reaction in a few hours.

Out of eighteen cases where there was a pronounced tendency to caries the saliva treated as just described showed in six cases an alkaline reaction, in four cases a neutral reaction, in one case it was amphoteric with tendency to alkaline, in two amphoteric with tendency to acid, in three neutral to weak acid, in one neutral to alkaline, and in one acid, the acidity corresponding to about two units (see *DENTAL COSMOS* for February).

The strongest acid reaction of about four units was obtained in a case of advanced diabetes where we might naturally expect sugar. Next to this was a case nearly free from caries but showing moderately active erosion, the saliva producing about three units of acid, being neutral at the beginning.

I conclude from the above results that there is no fermentable carbohydrate naturally present in the saliva under normal conditions in sufficient quantity to materially influence the origin and progress of caries.

THE SELF-CLEANSING FACTOR IN IMMUNITY TO DECAY.

Different dentures show very marked differences in regard to the efficiency of cleansing processes, whether spontaneous or artificial. In some the crowns of the teeth are so well formed and arranged

and knuckle up together so perfectly that as long as the interdental papillæ are in a healthy condition there is little possibility for food to lodge. In others we find the food sticking between the teeth everywhere. There can be no doubt that this circumstance is of very considerable consequence in regard to the origin and progress of caries. All places where food habitually lodges and can be only imperfectly removed are most liable to decay. For example, when a bicuspid stands inside of the arch so as to form a triangular space with the neighboring teeth all three teeth are sooner or later doomed to decay. Likewise when the gums recede in old age and the spaces between the teeth easily become packed with food we find extensive caries (senile caries) occurring in dentures which for fifty or sixty years may have been practically immune.

All the cases of immunity to caries which I have examined during the last few months have related to dentures where there was very little tendency to retention of food particles.

The comparative immunity of the lower front teeth to caries is due in a great measure to the fact that the food particles do not readily lodge about them, or if they do, as is often the case in advanced age when the gums recede and the teeth loosen, then these teeth appear to decay about as readily as any others. Both the physical and the chemical character of the food also demand consideration, but of these I shall speak later.

THE COMPARATIVE SUSCEPTIBILITY OF DIFFERENT TEETH TO CARIES.

There is a widespread belief that the structure and chemical composition of the teeth have a marked influence upon their liability to caries, and so-called soft teeth, poorly developed and imperfectly calcified teeth, teeth of inferior grade, etc., have very generally been looked upon as doomed to decay sooner or later. This belief was first attacked by Black in his memorable researches on the physical characters of the hard structures of the teeth. He arrived at the following conclusion (DENTAL COSMOS, 1895, p.

417): "Examinations of the density of the percentage of lime salts, and of the strength of the teeth, that are certainly reasonably accurate and include a sufficient number upon which to base trustworthy judgment, have shown that neither the density, nor the percentage of lime salts, nor the strength, is in any degree a factor in predisposing the teeth to caries, or in hindering its inception or progress."

No one has ventured to doubt the general accuracy of the experimental results obtained by Black. In fact, we know that the amount of calcium salts in different teeth is subject to comparatively slight oscillations. Very many practitioners, however, basing their beliefs upon practical experience and observation, have been very loath to give up the idea that different grades of teeth are liable to be attacked by caries in different degrees.

From a scientific point of view, moreover, the following questions which I brought up in my "Micro-organisms of the Human Mouth," 1890, p. 150, have not received the attention which they merit: "What is the relation of the lime salts to the glue-giving basis-substance? Are they precipitated in the cartilage according to physical laws, or are they held together by means of the organic substance, or do they enter into a chemical union with it? This is a matter of importance for the understanding of certain pathological phenomena exhibited by the teeth. As emphasized above, the variations in the amount of salts in the dentin are by no means great enough to explain the variations in hardness. But in the case of chemical union between the organic and inorganic constituents of the tooth, we should expect to find dentin hard or soft according as the union is stable or unstable."

The rate at which any calcareous body is acted upon by acids does not depend solely upon the percentage of calcium salts which it contains, but upon the stability of the compounds formed by those salts. A piece of tartar may contain more lime salts than an equal sized piece of dentin, and yet it will be much

more readily decalcified than the latter. Unfortunately our knowledge of the nature of the combinations occurring in teeth and bone is very incomplete, nor does it at present appear just how we are to approach this question experimentally.

I have already pointed out ("Micro-organisms," 1890, p. 196) that when teeth or fragments of teeth are subjected to the action of fermenting substance (bread and saliva) they are not all affected to the same extent. Similar observations were reported by Bogue, Jr., in the *Dental Review*, 1901, p. 184.

It seemed to me, however, that these experiments ought to be carried out with a greater degree of accuracy in order to decide the question definitely as to whether enamel and dentin from different teeth, or from different parts of the same teeth, are really acted upon in different degrees by the same agents or not.

The following experiments were carried out:

Experiment I.

Six-sided blocks of ivory, both of the hard (transparent) and soft (opaque) varieties, as well as of dentin of the walrus and sperm-whale were suspended in a fermenting solution of sugar in saliva.

In the course of six weeks it was found that the differences in the degree of softening were very pronounced. The ivory was decalcified to the greatest depth, the dentin of walrus somewhat less, and that of the sperm-whale to scarcely one-third the extent.

Experiment II.

Plates of different kinds of dentin 0.9 mm. thick were suspended in a solution of sugar in equal parts of saliva and bouillon, kept for the first few days in the incubator. The time was carefully noted when these plates had become sufficiently decalcified to permit their being pierced through by the point of a needle.

The results were as follows:

Soft ivory	65	hours.
Hard "	96	"
Pulp-stones from pathological ivory	120	"
Walrus	130	"
Sperm-whale	336	"

The resistance which the dentin of sperm-whale offered to the action of the acid was most pronounced.

Experiment III.

Sections of soft and hard ivory and of dentin from the tooth of a sperm-whale were suspended as in experiment II, 1½ per cent. of lactic acid being added to the mixture. The soft ivory could be pierced with a needle in 24 hours, the hard ivory in 48 hours, and the sperm-whale dentin in 192 hours.

Experiment IV.

Same as experiment II, with results similar, but the difference in time not so marked.

Experiment V.

Same as experiment II, with the following results:

Soft ivory	48	hours.
Hard "	120	"
Walrus	192	"
Sperm-whale	312	"
Human dentin	408	"

Determinations of the specific gravity of the different dentins under examination gave the following results. The specimens were taken from different teeth for the determinations A and B:

	A	B	
Soft ivory	1.76	1.72	sp. gr.
Hard "	1.84	1.83	" "
Walrus	1.92	1.92	" "
Sperm-whale	2.08	2.08	" "

It was a matter of some surprise and at the same time gratification when the results of the two determinations turned out to be almost, and in the case of walrus and whale absolutely, identical. On turning to the *DENTAL COSMOS*, 1890, p. 348, I found the following results:

Ivory (soft)	1.76	sp. gr.
" (hard)	1.84	" "
Dentin (milk tooth)...	1.88	" "
" (soft)	2.021	" "
" (hard)	2.073	" "

I was again agreeably surprised to find that the results I obtained at that time for soft and hard ivory were identically the same as those found in the determination A.

A chemical analysis of soft and hard ivory and of dentin of sperm-whale made by Dr. Carl Virchow gave—

	Water.	Ashes.	Ashes after restoring CO ₂ .
Soft ivory	10.5	54.8	54.8
Hard “	10.3	56.9	56.9
Walrus	8.7	60.4	62.1
Whale	7.4	66.7	67.3

Calculating the percentages for the dried substance, we have—

	Ashes.	Organic substance.
Soft ivory	61.2	38.8
Hard “	63.4	36.6
Walrus	66.8	33.2
Whale	72.7	27.3

The figures for ivory agree with those which I published in this journal for 1890, p. 348. It is particularly noteworthy that in case of the ivory no increase of weight was produced by treating the ashes with ammonium carbonate in the usual manner. This would seem to indicate that ivory contains very little or no calcium carbonate. I am inclined to think, however, that we have here to do with a slight error of experiment.

Aside from this, however, we see here such a marked difference between the dentin of the whale tooth and ivory, both in point of density (specific gravity) and percentage of calcium salts, that we have at least a partial explanation for the very great difference in the rapidity with which acids act upon these two dentins.

Between the soft and hard ivory the difference is much less pronounced and hardly sufficient to account for the fact that the one becomes decalcified so much sooner than the other.

At all events, these results compel the conclusion that there is a very great difference in the resistance which dentin from the teeth of different animals offers to the action of acids. We cannot, of course, be perfectly sure that this difference is due to the difference in density and percentage of calcium salts, since we have no means of discovering whether the calcium salts, for instance in case of the dentin of the whale tooth, do not form a more stable compound with the organic matrix than they do in ivory. We must accordingly be satisfied for the present with having established the fact that there is a great difference in the rapidity with which different dentins are softened by acids and that this difference bears a certain relation to the density of the dentin and to the percentage of calcium salts which it contains.

These results do not, however, justify the conclusion that the dentin from different human teeth must likewise show similar differences in regard to its susceptibility to the action of weak acids. Whether this be the case or not can be determined by experiment alone, and I hope to be able to present a contribution to the study of this question in a later issue of this journal.

CORRECTION OF A CASE OF UPPER ANTERIOR PROTRUSION.

By Dr. KASSON C. GIBSON, New York, N. Y.

(Reported at an informal meeting of the New York Institute of Stomatology, May 17, 1900.)

THIS extensive protrusion of the six anterior teeth on the upper jaw, as shown in the model Figs. 1 and 5, is from impressions of a jaw of a girl aged about thirteen and a half. The photograph Fig. 3 was taken of the child

about two years before treatment, and the deformity was not so marked then as when treatment was begun—January 27, 1898. The patient had a habit of sucking her lower lip.

There were three things that it was

important to avoid in the treatment: First, the elongation of the six anterior teeth; second, destroying the pulps; third, the possibility of throwing the teeth out at the apex. I therefore used a very simple appliance with the view of

having the treatment extend over a long period of time, thus obviating the too rapid forcing of the teeth backward. The

FIG. 1.



FIG. 2.



third, the possibility of throwing the teeth out at the apex. I therefore used a very simple appliance with the view of

regulating plate was made of vulcanite (Fig. 4), with a small gold wire passing out between the bicuspid on each side

and fitting accurately the labial surface of the six anterior teeth near the cutting edge. The wire from time to time was bent backward, increasing the pressure, care being taken to avoid too much pres-

the expansion of the jaw. The result could have been obtained from the wearing of one plate, but through an accident the original plate was broken and the one

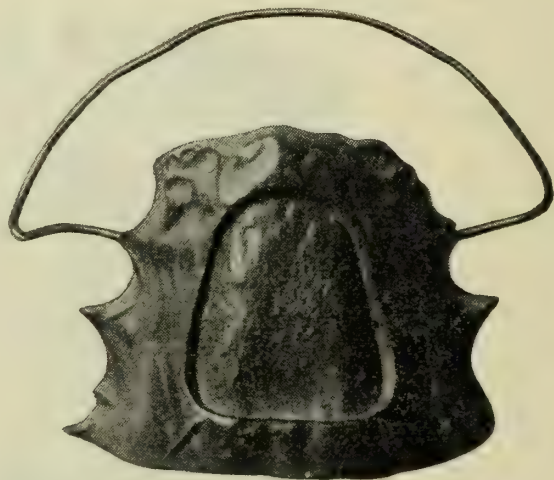
FIG. 3.



sure, as this would have destroyed the suction. Beyond the necessary care in adjusting the wire the patient was able without any difficulty to remove and cleanse the plate.

The special point of interest in the

FIG. 4.



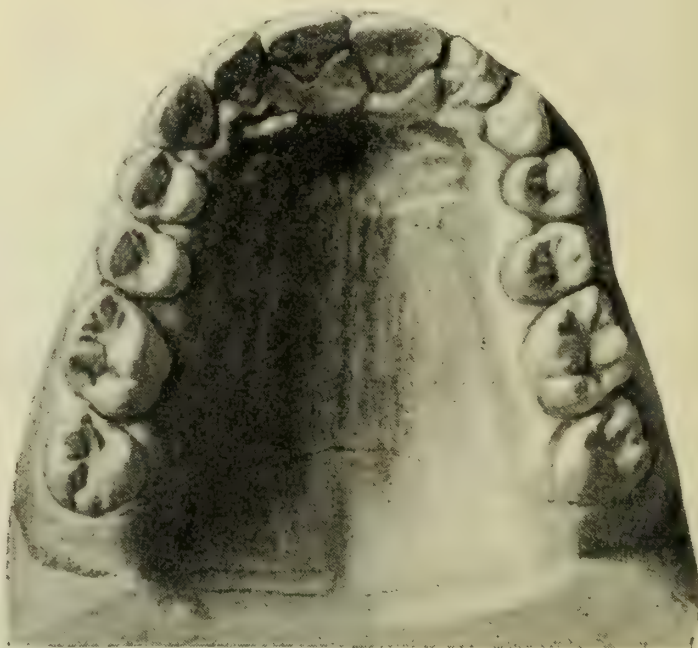
shown is a duplicate of it. This plate could be used as a retaining plate.

The measurements as taken on the models before and after treatment are as follows:

FIG. 5.



FIG. 6.



treatment of this case is the use of an air-chamber to support and retain the plate in position. Heretofore I had relied upon clasps and ligatures for attachment of the plate to the posterior teeth. The model Figs. 2 and 6 is from impressions recently taken, and shows not only the reduction of the protrusion, but

Between apices of buccal cusps of first bicuspid—Before treatment, 39.2 mm.; after treatment, 42.8 mm., showing a lateral expansion of the arch of 3.6 mm.

Protrusion of upper incisors beyond lower incisors—Before treatment, 12.8 mm.; after treatment, 6 mm., showing a reduction of 6.8 mm.

RECENT CONTRIBUTIONS TO “LEPTOTHRIX RACEMOSA” REVIEWED.

By F. VICENTINI, M.D., Chieti, Italy.

AFTER a period of silence (from 1890 to 1897), and thanks to the English translation of my work and to the photographic illustrations of *Leptothrix racemosa* supplied by Dr. Leon Williams, a number of trained observers and students of the flora of the mouth now appear to be engaged in the examination of the new organism, and it is to be hoped that their attention will not soon be diverted from the subject.

During past years I have published in the DENTAL COSMOS some comments upon the previous contributions of Dr. Williams, of Mr. Mummery, and of Mr. Goadby; and lately I also replied to a recent paper by Professor Arkövy, entitled “Ueber *Leptothrix racemosa* (Vicentini),” in the *Oest.-ungar. Vierteljahrsschr. f. Zahnheilk.*, my reply appearing in the same journal *q. v.*, 1902, pp. 8-33, and (reply) 1903, pp. 195-220, “Ueber *Leptothrix racemosa*. Eine Antwort an Herrn Prof. Arkövy.” I will deal now as briefly as possible with some other contributions to the subject.

On January 6, 1902, Mr. G. W. Watson read before the Odonto-Chirurgical Society of Scotland a paper on “*Leptothrix racemosa* in Relation to Dental Caries,” accompanied by sixty lantern slides and a preparation under the microscope. (See *Dental Record* for April 1902, pp. 163-165.) The author begins by saying that in 1888 I “detected the new organism in connection with those which are associated with dental caries.” To be exact, however, the first finding of the new organism dates from March 1890, and in no way did I suggest any connection whatever between the same organism and dental caries. But, apart from this slight difference, I must express myself as particularly indebted to

Mr. Watson for his indulgent appreciation of my work and the justice done to my descriptions. He not only regrets that little or no attention was paid to my communication for some years, but comes to agree with my views upon the common descent, from this single organism, of most of the scattered bacterial elements wandering in the mouth. “Vicentini,” he says, “asserts that this is the parent organism of most of the bacteria in the mouth, and it certainly looks as if there was some truth in this, as preparations made from scrapings of the teeth exhibit all the different varieties usually found in the mouth, as well as the characteristic peculiarities of *Leptothrix racemosa*.”

Against any view of the etiological value of *racemosa* is enlisted on the opposite side Dr. W. R. Blue of Louisville, Ky., who in teaching bacteriology allotted a portion of the course of instruction to the examination, in hanging drops, both of *L. racemosa* and of *Penicillium glaucum*, considered by him as the “higher non-pathogenic micro-organisms.” (For his paper, read before the Institute of Dental Pedagogics, see DENTAL COSMOS, 1902, p. 716.)

While pleased with the attention directed to my descriptions by Dr. Blue, I am somewhat in doubt whether, with the exception of a synthetic glance at the fruitful heads of *racemosa* considered in their entirety, the time allotted to the course would have provided room enough for a further and analytical examination of the various appurtenances of the same organism, *e.g.*, the peduncles, the involving *glia*, the implantation roots at the bottom and the swellings at the apex of the younger threads (the so-called *Cladothrix buccalis* of Mr.

Goadby), the reserve gemmules within the matured filaments, the inclosed bacteria within the old ones, the continuity of certain filaments with certain chains, and so on.

But, apart from the above demonstration of the fruitful heads, the complex morphology of the new organism could be illustrated, I think, even further by that of the other phase-forms described by me as male organs. These forms, except the indirect confirmation unintentionally given by Professor Arkövy (see my reply to the latter in *Vierteljahrsschr. f. Zahnheilk.*, 1903, pp. 211, 212), were passed over by other observers. But, at least in their full growth, the said organs could be easily shown to the class in a short time. At any rate, for the better understanding, let me recall that they may occur under two distinct phase-forms, *i.e.* first in their younger condition, like receptacles (sheath-expansions) representing perhaps a kind of spermogonia or antheridia (Figs. 2, *n* below, and 28, of my work), and secondly in their full development, like the horse-hairs of a cylindrical brush (productions by points—*ibid.*, Fig. 14).

The form drawn in my Fig. 2, *n* below, was once found by me in a sputum of whooping-cough. The sheath-expansion drawn in Fig. 28 may be, though very seldom, met with in some specimens of the *patina dentaria*, intermingled with a number of fruitful heads and nearly surpassing them in height. For both the said forms, the usual staining with gentian violet will suffice, provided the highest powers be at our disposal. But, for gathering the productions by points (Fig. 14), the *patina* should be purposely taken, before a meal, from persons who are not in the habit of using tooth-brushes or powders. The specimens should be gathered in somewhat bulky mass and mounted unstained, without much pressure upon the cover, for examination under a medium power or even a dry object-glass, according to the directions given in the work quoted, at page 121. Nevertheless, considering how much these latter forms are liable to disintegration, I have since found that

uncovered specimens, under a water-immersion lens, will sometimes answer better than mounted ones. (See *Compt. rend. de la Société de Biologie*, October 27, 1893, p. 841.)

Let me add here a few words on Dr. Geo. Granville Bantock's address before the British Gynecological Society, upon "The Modern Doctrine of Bacteriology, or the Germ Theory of Disease," second edition, London, 1902. In an Italian translation of the first issue of this interesting paper (in the *Gazzetta Medica* of Rome, for August 1899), I touched on some coincidences in the views of the author with my own, relating to the action of bacteria upon the human or animal economy, though at that time Dr. Bantock was not yet acquainted with my work.

Now, while indebted to the author for calling so much attention to my work, and gratified at his agreement with various statements of mine (see abstracts which he gives at pages 15, 16, 59-62, and 66, 67 of his address), as well as thanking him for his kind private communications, I hope that that agreement on the part of such an experienced surgeon—combined with that of some other medical authorities—will warrant me against any imputation of temerity in my skepticism regarding the so-called pathogenic bacteria, and that it will, on the other hand, promote further researches upon the new organism.

To Dr. Bantock and to the late Dr. Tait belongs, as is well known, the credit of having practically shown the uselessness of the spray and the damage from antiseptic washings of the peritoneum in abdominal operations, as was explicitly acknowledged by Lord Lister in 1890 before the International Medical Congress at Berlin, and in 1896 before the British Medical Association at Liverpool. But in the present address the criticism of Dr. Bantock spreads over the whole field of bacterial pathology. In the preface to this second edition of his address he points, moreover, to "the favor with which the first issue of his paper had been received, not only by members of the profession but by others

outside who seem to take interest in the subject, as shown by the large correspondence with which he had been honored,” and to the fact “that amongst his professional brethren the belief is steadily growing that the modern doctrine of bacteriology has been driven too far, and its usefulness thereby impaired.”

More recently Mr. Goadby returns to the subject of racemosa—from page 185 to page 191 of his text-book entitled “The Mycology of the Mouth,” London, 1903, for a copy of which I am heartily indebted to the author. In perusing this interesting work, however, I have been at first glance somewhat surprised that Mr. Goadby still maintains the objections and difficulties previously advanced by him on account of the peduncles in the fruitful heads of racemosa, though the objections alluded to had been already solved by me, by showing that the peduncles in question are really present and are not artifact, and that they are in fact transversely implanted one by one around the fruitful stems. It will suffice for the purpose to refer the reader to the respective passages of my second reply to Mr. Goadby (DENTAL COSMOS, 1902, pp. 674-676).

As far as I am aware, Mr. Goadby appears to have now first introduced in a methodical treatise of bacteriology a morphological description of the new organism. The author has, moreover, accompanied this description by some of Dr. Williams's photographs. But he still seems to consider the same organism as, so to speak, a simple object of curiosity, or a merely fortuitous inhabitant of the human mouth; while I have already shown that racemosa must, on the contrary, be regarded as the true parent organism of the numberless cocci, dumb-bell, and elliptical bacteria of the buccal cavity, as well as of the spindle-like, comma, snake-like, and other slender bacilli wandering there (see DENTAL COSMOS, *loc. cit.*, p. 678)—a common descent which was entirely or partly recognized by Dr. Williams, by Dr. Watson, by Professor Arkövy, and others. Let me reproduce here the following passage from my reply to the latter author:

“Only I regret that Professor Arkövy, though so explicitly recognizing our racemosa as a parent organism of various minute bacterial elements, seems to have entirely overlooked a consideration of prime interest, which had been repeatedly emphasized by Dr. Williams and by myself, *i.e.* the luxuriant vegetation of this parent organism, which (besides the matrix, the lower stumps, and the male organs) thrives, by more than a trillion and six hundred billions of stems and fruitful heads, upon all the sound teeth, each stem containing a number of reserve gemmules apt to become as many inclosed bacteria, and each fruitful head bearing hundreds of sporules. It is precisely against this capital fact, as against a firm rock, that most of the objections or difficulties advanced by our critics are likely to be wrecked; inasmuch as the new organism, as I said in my second reply to Mr. Goadby (DENTAL COSMOS, 1902, p. 677), “cannot be merely considered as a fortuitous inhabitant of the buccal cavity, but it deserves undoubtedly the greatest attention as being the most complex, the most prominent and indestructible organism—the organism *par excellence*—of the human mouth, and one which has not yet been found in its full growth elsewhere, neither in the external world nor upon some other part of the body.” (*Vierteljahrsschr. f. Zahnheilk.*, 1903, pp. 219, 220.) I am sorry to say that, like the preceding observers, Mr. Goadby in the morphological sketch alluded to has entirely passed over the male organs spoken of above.

After the previous remarks, some other statements of the author seem to deserve special consideration; and first, the question of the classification of bacterial species. That a classification of these microorganisms could not be absolutely arrived at on the ground of the culture and inoculation methods alone, was already stated *passim* in my work as well as in my previous articles. (See DENTAL COSMOS, 1901, pp. 858-863, and *Vierteljahrsschr. f. Zahnheilk.*, *loc. cit.*) I take now the liberty of recalling here the following passage from the latter article:

“Professor Arkövy gives a full *résumé*

of the literature regarding the classification of bacterial species, from Winter to Migula and to the recent treatise of Schmidt and Weis; but I could not follow him so far. Only I dare advance a simple consideration, *i.e.* that all the systematic classifications of bacterial species hitherto suggested are until now doubtful and provisional, as I showed in my first reply to Mr. Goadby (*DENTAL COSMOS*, 1900, pp. 717, 718), and that, moreover, in making the said classifications, the dissevered bacterial elements and the allied forms were one by one ranged and tabulated into as many independent genera and species, apart from and without any suspicion of, the *capital finding* of a true fructification process in one of these micro-organisms, playing the part of a true parent organism." (*Ibid.*, pp. 218, 219.)

But, in order to clear up the same vexed question of the classification, I think it is necessary, rather than to look back at what had been done before the discovery of the new organism, to look forward at what is yet to be done in connection with the new and higher phases of bacterial life detected in *racemosa*, inasmuch as these higher phases may lead us to profoundly modify all the foregoing classifications of the micro-organisms.

"Unyielding adherence to bacterial pathology," said the *Medical Age* in 1897, at page 241, "has worked some changes that are not, apparently, for the best, particularly in the domain, strictly, of disease amelioration. It has belittled clinical research and practically swept away pathological and physiological therapeutics except in so far as the latter may relate to the direct annihilation of germs—cause and effect beyond the one line having been to a considerable degree ignored. While we are not prepared at the present moment to accept unreservedly or unhesitatingly all of Vicentini's conclusions, the evidence is of such a character that it demands careful consideration, and doubtless will lead to newer and better changes in classification. And when the fact is considered that in the domain of natural history the

life-study of a single species has never yet been perfectly accomplished by a single individual in the brief period allotted to man upon earth, it is readily comprehended how errors may arise regarding the life-history of forms of which we have no knowledge except as seen cursorily within the field of the microscope or under the artificial conditions of laboratory propagation and culture. The question is a 'burning' one, and if the conclusions of Vicentini are correct it is apt to prove of serious moment to younger practitioners who have been taught to consider microbiology the sum and substance of all medical science; for they will, in such case, be obliged to begin the study of medicine in a measure anew as regards the mutual relations of physiology, pathology, and therapeutics."

Even Dr. Williams appeared to be of a somewhat analogous opinion, two years after, in his communication before the New York Odontological Society. Thus (see page 330 of the *DENTAL COSMOS* for 1899) he said: "I have in the foregoing pages several times called attention to evidences of the pleomorphism of the bacteria of the mouth, but I have now to present to you most complete evidence on this point of a somewhat startling and revolutionary character, and containing matters of the deepest interest not only to dentists and medical men, but to bacteriologists in general. The study of the life-history and pleomorphism of the bacteria found in the human organism has, I will venture to say, been too much neglected. The reason for this may perhaps be partly found in the inherent difficulties of the problem, and also in the pleasure and prestige which the investigator finds in the cataloguing of so-called new species. And although it has from time to time been suggested by those who have studied this subject from the point of view of the botanist and the biologist that the many forms of bacteria known may in many instances represent but passing or accidental phases in the life-history of some organism, although they have pointed out that many fungi whose life-history has been completely followed out have supplied strong evi-

dence that the parent organisms are comparatively few, still the cataloguing of species has progressed until there are now, I believe, not far from a thousand species registered.” And at page 333: “The tendency with the pathologist, who is chiefly concerned to find a specific cause for his disease, to regard every separate form of micro-organism which appears constant under a single method of cultivation as a distinct species is perhaps quite natural, but there is not room enough for the truth in any theory which is not large enough to contain *all* of the facts.”

Likewise at page 335 he added that “The discovery of the new organism must be regarded as the most important in the entire history of the bacteriology of the human mouth, and one which appears to be destined to profoundly modify our entire conception of the whole subject.” And elsewhere: “I have no disposition to indulge in speculation over these discoveries, but here are the facts which must be reckoned with in all future considerations of the bacteria of the human mouth and body. It would be folly to deny that these facts are big with possibilities.” (*Ibid.*, pp. 345, 346.)

Now, to this may be added that, as I stated elsewhere, not only *L. racemosa*, but even pneumococcus and tubercle bacillus, and, according to Mr. Goadby himself, even “*B. anthracis*, *B. subtilis*, *spirillum cholerae*, and many others, the streptococcus even at times forming a chain of rod-shaped bodies,” may show likewise a morphological evolution toward the higher fungi, and that, according to Hueppe, “the ray-fungus actinomyces is nearly related to Cladothriceæ, and, what is even more interesting, the suggestion has latterly gained ground that both the diphtheria bacillus and the tubercle bacillus are a stage in the life-history of some of the species of cladothrix or streptothrix.” (Goadby, in Smale and Colyer’s treatise, pp. 214 and 225.)

At page 200 of the present text-book, Mr. Goadby returns to the subject in the following terms: “Still later Nocard,

Eppinger, Moeller, and many others have shown that some branching fungi of the actinomyces class are ‘acid-fast’—that is to say, they resist the decolorization with weak mineral acids when stained with hot carbofuchsin, just as do the tubercle, leprosy, and smegma bacilli. Portions of the threads are under these circumstances almost indistinguishable from the tubercle bacillus, especially when the examination has to be made in sputum, as cited in the case described recently by Birt and Leishman.”

Now, how much perplexity was engendered by the above facts in some minds may be easily understood by the following passage of Professor Günther: “It must be considered that in the latter years, in some micro-organisms whose bacterial nature had been universally admitted, some ramification-like forms were detected by many observers. Such a fact was verified in tubercle bacillus by Klein, Fischel, Coppen Jones, Bruns, Semmer, Babès, and Levaditi; in diphtheria bacillus by K. Fraenkel, Bernheim, and Folger; in pseudo-diphtheria bacillus by Kanthack and K. Fraenkel; in *Spirillum undula minus* and *Vibrio rugula* by Kutscher and Zettnow, and in another undetermined bacillus by Stoltz. Hitherto the various authors have not concurred, however, in opinion as to the meaning of the fact. Most certainly the ramifications here concerned have not been found in young cultures, but incidentally in the old ones. Therefore, in my opinion, no positive proof could assist us in excluding from the list of the schizomycetes those species which show the said ramification, and for relating them to the hyphomycetes, according to the claims of some authors. Ramification among the hyphomycetes appears indeed as a characteristic of the young growths, while we know that in old bacterial cultures the most varied morphological changes may take place. By this I do not pretend that the ramifications here described, as they occur at times in this or that bacterial species, must be without exception related to ‘involvement forms,’ but, for some of them,

such an explanation will seem the most plausible one." (*Treatise of Bacteriology*, Italian ed., 1902, p. 15.)

But, by considering the life-history of *racemosa* as the most complex bacterial life-cycle within our acquaintance, and its relationship with the dissevered bacterial elements of the mouth recorded until now as so many independent beings, it will appear extremely probable that some change in an analogous direction could happen as well in other bacteria. In the same way that we could not relate the fully developed parent organism *racemosa* to the class of hyphomycetes, and relate in their turn its various scattered particles to the class of schizomycetes, while both the said conditions belong together to the same species, likewise we could neither separate the one from the other the common dissevered bacterial elements as such from this or that more complex phase-form which in another life-stage they might eventually present. The suggestion advanced by Professor Günther, that the said ramification forms could, on the contrary, be related to some "involution" phase rather than to an "evolution" process of the respective bacterial elements will appear then to be a very improbable one.

No wonder, on the other hand, that these ramification forms did not occur in the young cultures, inasmuch as in young cultures the dissevered bacterial elements may be only able to multiply by fission, thriving there in a rudimentary condition which, after Dr. Billet, I named their *dissociated* state. Such a wandering life-stage appears, indeed, to be destined to spread the species *extensively*, when the respective bacterial elements cannot do so *intensively*, i.e. by further development upon a firm and appropriate soil, like (for the mouth bacteria) the surface of the teeth. No wonder, likewise, that certain old culture soils could enable some of the said bacteria (when their spreading phase becomes exhausted) to initiate at times some higher, though more or less incomplete, development toward a creeping, mycelial, or aerial-like state, playing, to some extent, the same rôle which the

enamel cuticle plays in *racemosa* growth. See on this subject my second reply to Mr. Goadby (*DENTAL COSMOS*, 1902, p. 677) and the respective passages of my work.

From this standpoint, it seems to me that the whole group of bacteria should henceforward be ranged into two distinct series, namely, that of the highly evolved or true and proper *complex micro-organisms*, and that of the *rudimentary bacterial elements*, whose life-history appears still to be confined within a merely dissevered or monocellular condition without further development—with this notable difference, however, that the upper series could from time to time be increased even farther at the expense of the lower one, but not *vice versa*. In other words, while no complex micro-organism, belonging to the higher series, could in any respect retrograde into the lower series of the permanently rudimentary elements, some of the latter could, on the contrary, be rightly raised from the lower series into the higher one, upon their being acknowledged, as the result of further study, as belonging in their turn to some other complex micro-organism.

Now, most of the so-called pathogenic bacteria being ranged just in the upper series rather than in the lower one, it will be made quite evident that the so-called pathogenic power, when real, could not be further retained as a true original property—inherent, so to speak, in the botanical entity of this or that parent organism considered in its whole; and consequently that the said pathogenic power could not be further maintained as a decisive criterion for the classification of the respective micro-organism, but could only be related to this or that accidental contamination of some of its scattered particles. So that the supposed virulence, for instance, of the tubercle bacillus could not be imputed to some poison or virus originally produced by the parent streptothrix, or *Leptothrix racemosa*, but only to a kind of contamination undergone by some of its scattered particles through this or that environment or soil.

These statements appear so undeniable that Mr Goadby seems to agree with some of them, as where he says: “It seems not improbable that the various pathogenic bacteria which are to-day associated with disease were at one time simple saprophytes, and that some of the simple saprophytes, as we know them to-day, may yet attain pathogenic powers. Not to admit such a development of pathogenic power entails the obsecution that pathogenic bacteria were created by design to destroy human life, and, moreover, such a refusal places us at variance with the monistic conception of the universe, and the orderly operation of the laws of evolution with which all observed phenomena accord.” (*Text-book*, p. 8.)

Apart from the monistic conception alluded to,* I am pleased at the agreement of the author with some of the remarks previously advanced by me, in 1890 and 1895, relating to the above ramification and staining phenomena. Thus, at pages 141 and 219 of my work I referred to the ramification forms described in tubercle bacilli by Professor Klein, by Mr. Coppen Jones, and others, and at page 219 I also made mention of certain minute and pointed cocci endowed with “acid-fast” reaction, noticed by me in fecal matter. Moreover, at page 142 I stated that “Two or more bacteria totally different in their pathogenic action may proceed from a single organism, and that a non-pathogenic bacterium may belong, in its turn, to the same micro-organism from which a pathogenic

bacterium proceeds,” and at page 208 I pointed also to the possible affinity between the saprophytic bacteria and the pathogenic forms, nearly in the same terms as in the quoted passage of Mr. Goadby. Later, in my reply to Mr. Mummery’s communication (*DENTAL COSMOS*, 1901, p. 860), I dealt with some shades and faint unequal staining detected by me in certain specimens of tubercle bacilli.

Now, by all the above facts, in connection with the complex life-history of *racemosa*, the independence of the so-called pathogenic power from the botanical entity of bacteria being once acknowledged, the most convinced and fervent bacteriologist could not avoid asking, “What, then, is the cause which makes a given bacterium hurtful or infectious in some instances, and harmless in some others?”

Evidently, the question being reduced to such terms, in order to understand the various laboratory experiments we are urged anew to have recourse to the intervention of some poison, virus, or morbid *quid*, independent of the botanical entity of bacteria, but borrowed, I repeat, from some accidental source. Though mostly unknown, the causes may be numberless by which a bacterial culture can prove hurtful to animals experimented upon. Among them, a contamination brought by the *refuse products* of a still normal excretion or by the *morbid products of a pre-existent disease* in which the bacteria were previously involved, or by the same artificial conditions of bacterial life created in this or that laboratory experiment by the *experiment itself*.

“The suggestion which Vicentini and others have made,” said Dr. Williams, “to the effect that the pathogenic qualities of bacteria are probably acquired and not necessarily permanent, should have the most careful consideration.” (*DENTAL COSMOS*, 1899, p. 349.) Thus, in other words, the fundamental problem already proposed by me again arises with all its *incognitæ*, and, through the immense amount of bacteriological work, the mystery of the infection reappears at the moment our opponents believed them-

*As to the laws of evolution in relation to bacteria, let me reproduce here the following passage from one writer: “Have the microphytes of all the diseases flesh is heir to come down in an unbroken line of descent, or are they traceable to some simple germ of prehistoric ages when man’s only diseases were the wounds received in battle with those extinct monsters he has now exterminated? And what relation in the biological scale do these organisms bear to one another? Are those most destructive to life to be considered higher or lower in the scale than those which only cause inconvenience? Are plague and cholera, *e.g.*, higher types than influenza? smallpox than cholera? These questions must be answered before medicine can become an exact science.” (*Westminster Review*, 1900, vol. cliv, p. 327.)

selves to have overcome it. See, for further particulars, the paragraphs devoted to the "action of bacteria upon the human or animal economy," from page 203 to page 216 of my work, and also elsewhere.

But, losing sight of this essential point of the controversy, Mr. Goadby seems to have entirely disregarded that, owing to his own admission, the pathogenic power in question, even when real, could by no means be further retained as a true distinctive criterion for the classification of bacterial species. And it so happens that, while admitting for certain forms of bacteria a derivation from some higher organism, the author still holds the independent entity of the other dissevered or monocellular elements, credited till now as so many independent species, without any suspicion that these asserted species might be likewise nothing but passing or accidental phases, either of our *racemosa* or of some other complex micro-organism.

At any rate, the *onus probandi* as to this asserted independent entity of the above dissevered elements must henceforward be mainly charged on our opponents, inasmuch as the most probable conjecture stands, on the contrary, for the derivation of the said elements from simple scattered particles of *racemosa*, *i.e.* of a parent organism which, as I have shown elsewhere, may in fact give rise to all the different dissevered forms of mouth bacteria, and may besides spread them throughout the whole body. Consequently, until an exhaustive proof of the actual independence of the said bacteria from this parent organism shall be given, the question, I repeat, will remain open. For brevity's sake, I refer on this capital subject to my previous reply to Mr. Mummery's communication. (DENTAL COSMOS, 1901, p. 863.)

I forbear for the present from presenting various further considerations on the subject which would carry us too far, and will limit myself to the following remarks relating to two other peculiar points of Mr. Goadby's work.

At pages 175-180, under the heading

of "Pyorrhea Alveolaris," I have been somewhat surprised that no mention whatever was made by Mr. Goadby, either of the paper of Professor Arkövy as referred to above, or of the parasitic growths which, in this disease, were found by the latter author within the pus pockets around the teeth and were related by him to some new and further phase-forms of *racemosa* itself. (See Professor Arkövy's plate in *Vierteljahrsschr. f. Zahnheilk.*, 1902, p. 32.)

Finally, at pages 200-205, the statements of Mr. Goadby on the peculiar thread forms, which he first named *Cladothrix buccalis*, appear at present to have been substantially modified, inasmuch as these same threads would belong now not only to another species, but, according to the later views of the author, to a quite different genus—namely, to the genus *Streptothrix*.* But Mr. Goadby seems to have entirely forgotten that a quite identical growth had been already described by me and related to the younger filaments of *racemosa*, since 1890, and that he himself had explicitly acknowledged such a priority in 1901, in a chapter of Smale and Colyer's treatise, in the following terms: "Vicentini in his researches, and Williams also, came across this curious organism, but passed it over with a few remarks." And soon after: "Vicentini did not isolate the organism he observed, but there is no doubt that it is the same." (Smale and Colyer, p. 227.) The reason, however, why I dealt so briefly with this thread form was pointed out in my second reply to Mr. Goadby. (DENTAL COSMOS, 1902, p. 679.)

From which, when necessary, we could deduce further proof of that uncertainty and merely provisional character of the modern methods for the classification of bacterial species which I have pointed out above.

*In a footnote of my reply to Professor Arkövy (*Vierteljahrsschr. f. Zahnheilk.*, 1903, p. 218), occurred a misprint by which the later views of Mr. Goadby on the threads here referred to were represented as related to the genus *Leptothrix*. There, for "Leptothrix" must be read "Streptothrix."

AN APPLIANCE TO HOLD COMPRESS IN HEMORRHAGE FROM TOOTH-EXTRACTION.

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ON September 15, 1902, I was called to see Mrs. C., age 32, by her attending physician, who had been trying to arrest a hemorrhage from the socket of the right second molar of the upper jaw. On arriving at the house I found the patient very weak, pale, and emaciated, with pulse hardly perceptible. She was very despondent, feeling positive that she was going to die; and, considering her condition, I decided that unless something were done immediately her prognosis would prove correct. I therefore proceeded to obtain a history of the case, which was as follows:

Seven days previous to the above date she visited a dentist, who extracted the tooth before referred to; she then went home. The bleeding stopped, but during the night started again and was continuous until I operated. Further questioning convinced me that this patient was of the hemorrhagic type, as she said any injury to the tissues, whether caused by accident or surgical interference, was always accompanied by a hemorrhage which lasted from three to five days. In the present instance the physician had been trying to control the hemorrhage but was successful only to the extent of three or four hours, when the substance with which he filled the socket would work out of position.

I now thoroughly examined the mouth of the patient, and by means of a probe introduced into the socket felt a small fragment of the palatal root, which had evidently been broken off during extraction of the tooth. The surrounding tissues were lacerated, and a slow, steady hemorrhage was in progress.

I advised immediate operation, and after consultation with the physician decided to operate under ether.

When the patient was thoroughly anesthetized I removed the broken root, which was about the size of a pea; then by means of a spoon-shaped curette smoothed all rough fragments of bone; made a deep groove in the bone, around the inside of the socket, and then irrigated thoroughly with full-strength hydrogen dioxid. I then saturated a large pledget of sterilized cotton with "Muraline" (which is an aluminum preparation), and under very great pressure forced it into the socket of the extracted tooth, and by the time the patient recovered the hemorrhage had stopped.

I prescribed a mouth-wash. Visited patient every second day for seven days, and then removed the compress. This started a slight hemorrhage, which, however, was easily controlled. Everything then progressed to a normal condition.

About three months afterward she visited me again; this time to be advised in regard to the extraction of the remaining upper teeth, which were the incisors, canines, bicuspid, and one molar. These were very much broken down, the crowns and part of the tooth below the gingival line missing; some of the roots were abscessed, and patient was in constant pain. Remembering my previous experience, I decided that if some kind of an appliance could be made to hold a compress, and a certain degree of skill were exercised in the extraction of the teeth, the operation might be considered safe, and advised her accordingly.

CONSTRUCTION OF COMPRESS-HOLDER.

The first step was to make a compress-holder, which I did in the following manner: I first took impressions of both jaws, and made models, which I then

put on an articulator, getting by this means the proper relations. I cut from the plaster model the teeth corresponding to the ones I intended to extract; then waxed over the lower teeth and on the ridge of the upper model a form corresponding to the Gunning splint used for fractured jaws, and made an opening for the introduction of diet. I vulcanized, finished and polished the same and had now a compress-holder such as is represented in the illustration.



I placed the compress-holder in the patient's mouth for trial, and after being satisfied that it fitted correctly made arrangements to proceed with the operation, which I did under ether, as follows:

Instead of extracting in the usual way, I grasped the root, or tooth, firmly and very carefully twisted it out of the socket, being cautious not to injure the process any more than was unavoidable. I followed the method suggested when replanting is to be done. After extracting each tooth, and before beginning on the next one, under great pressure I forced into the socket a large pledget of sterilized cotton saturated with muraline. I followed this method on each tooth before proceeding with the next one (washing out each socket before packing), and waited for the patient to recover from the effects of the ether; I then took a strip of sterilized gauze, folded it over four times, saturated it with muraline, placed it across the ridge over the other com-

presses in the sockets, adjusted compress-holder, and held the jaws together by a head bandage, which consisted of a skeleton head-cap, with bands running parallel with the rami of the jaws and across the chin, and a buckle on each band on the ramus, which allowed the jaws to be drawn firmly together.

After five hours hemorrhage was entirely controlled, and I removed the appliance the following day. I visited the patient every second day, and at the end

of the fourth day removed the packing from one socket. This was accompanied by a slight hemorrhage which was easily controlled. I did likewise in the case of the other sockets, waiting in each case for from twenty-four to forty-eight hours. The same slight hemorrhage followed the removal of each compress, but, as in the first case, it was easily controlled, and at the end of two weeks everything had returned to normal condition.

In removing the compresses from the sockets I exercised great care, doing it very gradually, taking three or four minutes for each one.

The patient is now wearing a temporary set of artificial teeth; is very happy and very grateful.

In using muraline under general anesthesia, care should be taken that the patient does not swallow any, as it is an emetic and may cause the objectionable and serious complication which follows vomiting under general anesthesia.

EPULIS.

By FANEUIL D. WEISSE, M.D., New York, N. Y.,

PROFESSOR OF ANATOMY, SURGICAL PATHOLOGY, AND ORAL SURGERY, NEW YORK COLLEGE OF DENTISTRY.

(Read before the Connecticut State Dental Association at its annual meeting, Hartford, Conn., April 21, 1903.)

THIS name is given to the neoplasms of the gum areas—fibroma, sarcoma, and osteosarcoma.

Frequency. McCurdy in his "Oral Surgery" quotes from Dr. Larabrie that of 1156 tumors examined by him in eleven years, from all parts of the body, 32 were epulis. This series would thereby establish epulis as occurring once in thirty-six tumors of all kinds.

Location. The inferior and superior arches are relatively involved in the proportion of two-thirds to one-third of cases.

Sex. Cases occur relatively in females and males in the proportion of five to three cases.

Age. The range of cases is from childhood to old age, but one-half of all cases occur before thirty years, and two-thirds before forty years.

Symptoms. A single nodule of the gum area: varying in size from a bead to a hickory nut, or larger; springing from an interproximal space between teeth or an alveolus containing a root of a tooth; covered by normal mucous membrane which may be somewhat purplish in color; pedunculated, involving one surface of the gum only, or non-pedunculated, involving one or both surfaces of the gum; of slow growth, if of any size having a history of several years' duration; may separate the teeth an eighth, a quarter, or even half an inch; at times may include a root and even a tooth, dislodging it; may be ulcerated if caught in the occlusion of the teeth; and may be recurrent, cases presenting that have been removed several times and have developed again.

Etiology. Devitalized teeth whose pulp-chambers and root-canals have not

been emptied of their necrotic contents and the teeth treated and filled, and retained roots—such tooth-conditions producing irritation of the gum or alveolo-dental membrane, thereby initiating the neoplasm. It is also possible that in some cases an accidental and unnoticed injury of the gum or alveolo-dental membrane may initiate the neoplasm.

Pathology. The pedunculated forms that spring from an interproximal space between teeth and involve one gum surface, or that spring from an alveolus containing a root, have proved in my experience to be fibroma. I am inclined to regard this variety as having its origin from the deep gum tissue in the former case and from the alveolo-dental membrane of the alveolus in the latter case. The non-pedunculated forms, involving one or both surfaces of the gum, springing from an interproximal space, and spreading the adjacent teeth apart, have in my experience proved to be sarcoma with giant-cell constituents, and sometimes they also contain some osseous tissue cells, constituting them osteosarcoma. I regard this variety as having its origin from the alveolo-dental membrane. It is sometimes stated that epulis—fibroma, sarcoma, and osteosarcoma—originates from the periosteum of the free surfaces of the alveolar process. I have always held that the free surfaces of an alveolar process are not covered by periosteum, the alveolar process being only a temporary osseous scaffolding for the support of the temporary and permanent teeth respectively, not present before the eruption of the temporary teeth but developing only as the need of tooth-support is required and disappearing by absorption when the permanent

teeth are lost. This life-history of the process proves that the presence of the alveolo-dental membrane is essential to the presence and perpetuity of the process. If the free surfaces of the alveolar processes were covered by periosteum the structure would not be absorbed as rapidly as it is after the loss of the teeth and their alveolo-dental membranes.

Prognosis. I have yet to see an ultimately fatal issue of a case of epulis—fibroma, sarcoma, or osteosarcoma. This leads me, when a case presents, to dispel the anxiety of patients even where the structure of the neoplasm is determined to be that of sarcoma or osteosarcoma. It is to be remembered that the sarcoma containing giant cells is the least malignant variety of the sarcomas, and the presence in the neoplasm of osseous tissue formation is not at all serious. Again, that the situation of the neoplasm is in a temporary scaffolding structure—the alveolar process—and that the growth having perfect freedom to protrude into a cavity, it does not bed, so to speak, so as to involve the body of the inferior or superior maxillary bone.

Prophylaxis. Remove the conditions favorable to the development of epulis by impressing upon patients the necessity of extracting roots of teeth and of having devitalized teeth emptied, pulp-chambers and root-canals freed of their necrotic contents, treated, and filled, in order to protect them from the development of these neoplasms.

Treatment. In view of the etiology of these neoplasms adjacent roots should be extracted and the vitality of adjacent teeth be determined. If one or both adjacent teeth contain fillings they should be removed, and if the teeth are found devitalized they should be emptied of pulp-chamber and root-canal contents, and treated, but not permanently filled until the neoplasm has ceased to recur. If the adjacent teeth do not contain fillings they should be tapped, by drilling through the enamel, at a proper point, and the sensitiveness of the dentin tested; if found devitalized they should be dealt with as above stated, and if

found to be normal the drill-holes should be filled with gold.

The local treatment of the non-pedunculated epulis—sarcoma or osteosarcoma—requires, as a rule, surgical operation, with the object of removing the involved portion of the alveolar process, encroaching as little as possible upon the subjacent body portion of the maxillary bone. This latter point especially applies to the inferior maxillary bone.

The operation is performed as follows: Adjacent teeth, where present, are extracted, the involved alveolar process is included between two cuts of a suitable saw, and the processes are removed with a pair of gnawing forceps, or the alveolar process is included and removed with a chisel and hammer.

VALUE OF ACETATE OF ZINC.

My principal object in calling your attention to the subject of epulis is to bring to your attention the value, as judged from my experience, of the local application of the crystals of acetate of zinc in causing the arrest of the growth when it first appears, the prevention of recurrence after excision of the pedunculated variety, and even the arrest of the growth and prevention of its recurrence after superficial excision of the non-pedunculated variety.

Given a case where at an interproximal point a small bead-sized epulis presents, the daily application of the crystals will cause its disappearance; should it recur the daily application must be resumed as required, until it ceases to recur. The application is made by taking up a small piece of cotton in a pair of small forceps, dipping the cotton into the crystals, and applying them directly to the growth for a few minutes. After the application all crystals should be wiped from the adjacent mucous membrane before the mouth is closed. The patient can be instructed how to make the application.

Given a case of the pedunculated variety, fully developed, cut it off deeply with a pair of suitable scissors and immediately apply the crystals, which will stanch the bleeding. Thereafter the

crystals should be applied once a day to the stump. The patient will experience a pricking sensation at the stump surface as they are applied, and during the day there will be some irritation of the area; the surface is at first blanched by the application.

TREATMENT APPLIED TO A CASE OF SARCOMA.

I will here detail a case of special interest. In January 1899 a female patient presented with an epulis of a year's growth, about the size of a large pea, located at the interproximal space between the upper central incisors of a full upper denture of beautiful teeth. It was non-pedunculated, involving both surfaces of the gum, and it had separated the incisors a quarter of an inch. It was evidently a case of the sarcoma variety of epulis, originating from the alveodental membrane. The question at once arose: Could the incisor teeth be saved by averting the necessity of an operation? The patient was told of the possible necessity of an operation which would involve the loss of the teeth, but at the same time she was told that were she willing to have it undertaken, an attempt might be made to save the teeth by arresting the further progress of the growth, and possibly effecting its ultimate disappearance; this, however, would take time and patience, and of course might not succeed.

The patient agreed to having the attempt made. The incisors were not filled and her dental surgeon was directed to tap them and test their vitality; the teeth were found normal, and the drill-holes were filled with gold. In January 1899 the neoplasm was cut away as

deeply as possible; the acetate of zinc crystals were applied and the patient was instructed how to apply them once daily. The growth persistently recurred and for seven months it was excised once or twice each month. Then there was an interval for two months (July to September 1899), when it was found to have recurred to some extent, and again for three months (September to December 1899) it was again excised once a month. The patient next called May 1900, when the growth was found to be about a quarter of its original size and there was an appreciable diminution of the space between the incisors. It was again excised repeatedly for two or three months, when the patient passed from my notice with directions to continue the application as required.

I had not seen the case since September 1900, but lately, desiring information for the purpose of this paper, I wrote asking as to the present condition of the case, and received the following answer, of date March 1, 1903: "In regard to my wife's case I would say, for about a year after her last call (this was September 1900) she treated herself, and since that time it has given her no trouble, and has not appeared to grow at all."

Considering the nature of the neoplasm, and the original conditions, this is certainly a remarkable result. I would here state that although there were persistent recurrences of the growth, they were notably and progressively less active during the progress of the treatment.

Having thus presented my experience with the local application of the crystals of the acetate of zinc in the treatment of epulis, I hope its true value will be widely tested by both the dental and medical professions.

CONSERVATISM.

By H. S. SUTPHEN, D.D.S., Newark, N. J.

(Read before the Southern Dental Society of New Jersey, at Camden, N. J., June 17, 1903.)

I TAKE great pleasure in again having the honor of appearing before the Southern Dental Society of New Jersey in the rôle of essayist. I shall attempt to point out to you in a plain, unvarnished, and straightforward way some of the mistakes we all fall into through our over-enthusiastic natures, and to suggest the remedy which experience—that great teacher!—has vouchsafed in no uncertain voice.

We are perhaps, more than other learned professions open to the allurements and great possibilities of the new fads and fancies—and, I may add, fallacies—of the various enthusiasts in our calling who are carried away by ideas which on their face appear to possess great value, but which upon careful trial prove to be either entirely valueless or harmful, or at least less efficacious than old and tried and proved methods of practice.

SOME EARLY FILLING METHODS— GOLD—COPPER.

Many years ago—before many, if not all, of us were even in our cradles—Dr. Arthur attempted to revolutionize the accepted method of filling, by advocating a wholesale cutting away of the tooth-structure, in making large V-shaped spaces between all the teeth. He presented the matter so forcibly before his *confrères* and the dental world generally that for several years it came quite extensively into the practice of the day. But a few years, however, sufficed to prove the extremely harmful results, not taking into consideration at all the discomfort suffered by patients in the loss of so much valuable tooth-substance and the crowding of food into the gums, with

the resultant soreness. The method was soon entirely given up, amidst many wailings from both patients and operators. To the very last, however, Dr. Arthur maintained the efficacy of his method, saying in proof thereof that his work had been so eminently successful that his patients never had occasion to visit him again. Another construction, however, was given to this fact by his brothers in the profession.

Passing on from this we came to the era of extensive gold work, when almost whole days were given to the insertion of a single filling. This was not as disastrous as the cutting away of the tooth-substance had been, but, except in the hands of a few of the superior operators, it met with but indifferent success; and much of the good that might have resulted was dissipated by the elements of shock and fatigue which are inevitable companions of such lengthy operations, and which cause more damage to the general system than the resultant good which may be accomplished.

Then we come to the copper amalgam craze, which spread over the country like wildfire. The advocates of this material proclaimed, in no uncertain voice, its positive qualities as a tooth-preserver; its ease of manipulation; its universal application in all cavities posterior to the canine teeth; its freedom from staining the tooth-structure, and other qualities that it is not necessary to mention here. As a result, thousands of ounces were used throughout the length and breadth of the land. You all know the result: how almost every point advocated in its favor was disproved, to the sorrow and mortification of its users. It may still have a place among our filling materials,

but so small a one that it is hardly worthy of mention.

BRIDGE WORK—CATAPHORESIS—PULP-MUMMIFICATION—PORCELAIN.

Bridge work then claimed our attention, and the most extensive operations were wildly advocated by leaders in this line of work. Many valuable teeth were cut off and the whole arch bridged over with only three or four indifferent supports, with the result that in a short time these failed and the inevitable plate had to be inserted.

Bridge work properly done, intelligently and artistically constructed, is one of the best methods we have of restoring lost members of the dental arch; but it should be done with the greatest care and study of the environment.

Several years ago cataphoresis engaged our attention. Every dental meeting was occupied to a very large extent with its discussion, and the dental magazines were full of it. All sorts of appliances were put upon the market and we all "bit" at the tempting bait—not with as much sorrow, I may add, as with many of our other investments, but with the same result, namely, that the apparatus was relegated to the topmost shelf of the laboratory or the deepest recess of the cellar.

The harm done by cataphoresis was, on the whole, not great, the worst result being, probably, that when success was obtained in obtunding the dentin, either exposure of the pulp was brought about, or so much structure was removed that it led to the subsequent death of the pulp, with its attendant trouble to patient and operator alike. But the time consumed in its application, and the uncertainty of positive results, finally caused the practical abandonment of the method.

Pulp-mummification has been very strongly advocated in various sections of the country, and its disciples have been very enthusiastic in its praises. Statistics in this matter, however, have not been furnished, and I am not in possession of any facts to show whether the practice has been successful or otherwise.

It certainly would be a boon to us in many instances if it could be relied upon to do the work claimed for it.

A little more than a year ago we had Archite cement placed before us in such an enticing manner, and with such wonderful promises of its remarkable properties, that we all opened our arms to it, using it with all the hope of the fulfillment of our longings for a cement filling that was to be ideal. How quickly our hopes were shattered you all know, and also the bitterness and chagrin we felt as filling after filling had to be replaced.

Shall I dwell upon porcelain? We are in it now. Its possibilities are great, and it seems to be the ideal filling for a large majority of the cavities which come to us. But its manipulation is so very different from anything we have been in the habit of doing that great care and discretion have to be used, and we should be slow in its general adoption, rather allowing ourselves to grow into its use.

THE TRUE AIM AND PROPER SPIRIT IN DENTAL WORK.

Our aim in all our work should be the preservation of the natural teeth; and we are in duty bound to do all in our power to attain this much. Any method, any filling, which will best accomplish this end we should adopt, and devote our best efforts and our greatest skill to it. We have no right to experiment with new, radical methods which may cause the loss of the members we are trying to save. We should not be the first to depart from accepted methods of practice, taking up without due consideration every new thing which is presented; nor, on the other hand, should we be with the last in the procession to adopt what promises to result in good. There is a golden mean here as everywhere, and our judgment should be exercised to sift the chaff from the wheat.

Science tells us that a sound once produced starts vibration in the air which will continue as long as time endures. It is so with our work. Its results are far-reaching, and our successes and our failures alike are irrevocable; we should appreciate this in its fulness of meaning,

and be most careful and conscientious and painstaking in all our operations, knowing that we are not building for an hour or a day, but for all time; not for

ourselves alone, but for our children, for the world, and for the good repute and respect and the future welfare of our beloved profession.

THE USE OF TROPACOCAIN IN DENTAL EXTRACTIONS BY SCHLEICH'S METHOD.

By Dr. G. MAHÉ, Paris, France.

HAVING read in the "Periscope" of the DENTAL COSMOS for May 1903 a summary of the paper by Fuchs-Goeding on the "Use of Tropacocain in Dental Extractions," I take this occasion to once more express approval of this method of producing local anesthesia. I really fail to understand why its use is not more general.

Eleven years ago, Chadbourne of Boston introduced this alkaloid into pharmacology. Almost immediately—in December 1892—Pinet and Viau, of the Dental School of Paris, applied it to gingival anesthesia. Although their results were excellent, their method did not become general. I think this was due, first, to the extremely high price of the new salt, and second, to the undoubted esteem existing for cocain.

But new facts have since been adduced which lead to a modification of these conditions. First, since a better conception has forced us to admit other than successful results, we have perceived that cocain was not, for the odontologist, an anesthetic entirely without imperfections; that often it occasioned, whatever may be said, effects more or less serious, which have compelled us continually to diminish the dose. This decrease has also considerably diminished the efficacy, and especially the certainty, of cocain anesthesia.

Latterly, Willstätter, by his discovery of a means for producing a synthetic tropacocain, has notably reduced the cost of this alkaloid.

Unhappily, before tropacocain could be introduced into daily use, and inasmuch as the imperfections of cocain were becoming evident, other alkaloids were discovered and were used as substitutes for the latter drug, acquiring great vogue among medical practitioners, although they were inferior to tropacocain.

The more eminent experimentalists have, indeed, stated that tropacocain is less toxic by one-half than cocain, with an anesthetic power about equal. Among the other substitutes for cocain the anesthetic qualities decrease in ratio with the toxicity.

Such are the reasons for my generally preferring tropacocain to cocain for local anesthesia.

With regard to Schleich's method, I was preceded by a Swiss physician, Dr. Custer, who, as early as 1898, substituted tropacocain for cocain in Schleich's formula, and asserted its superiority. His paper incited me to try tropacocain for infiltrating the gum, and my own paper was published by *l'Odontologie* for November 1899. I do not know whether other authors have published similar articles on this same subject, but it is sufficient to say that M. Fuchs-Goeding has added nothing new on this point.

On the other hand, I found by experiment that the results were better when sodium chlorid was in solution with tropacocain in the proportion of two parts of sodium chlorid to one of tropa-

cocain. Thus I introduced this formula:

R—Tropacocain (hydrochlorate), 0.1 gm.;
Sodium chlorid, pure, 0.2 “
Distilled water, 50.00 “

A scientific statement of MM. Lesné and Richet, Jr., presented to the Société de Biologie, March 21, 1903, has given to my empiric remarks an additional interest, inasmuch as those authors have proved that *sodium chlorid, added in excess to a toxic substance, diminishes its toxicity by one-half*, and they have demonstrated it particularly with cocain.

Stimulation of anesthetic properties and lowering of toxic power are the advantages of this formula, and I repeat the conclusions which I expressed in 1899, without a single modification:

1. This solution is so simple that no practitioner will hesitate to prepare it.

2. In regard to anesthetic power:

(a) It is notably greater than Schleich's solution, and

(b) With an equal volume it is about ten times less toxic than a solution of cocain at one per cent.; that is to say, its toxicity is practically *nil*.

(c) With an equal quantity of alkalioid, the volume to be injected is five times greater, and moreover the infiltration, or distention of the tissues—that is, in ratio to volume—bears a part in the production of anesthesia; on the other hand, this great dilution extends over considerable operative surface. (If we consider five centigrams of cocain as the maximum to be used on the face, this quantity, which is represented by five cubic centimeters when the solution at one per cent. is used, rises to twenty-five with Schleich's solution, and reaches fifty with my own; that is, if it be admitted that tropacocain is twice less toxic than cocain.)

3. Neither sterilization at 118°C. nor age alters it. On the contrary, it has seemed to me that this solution “ripens” with time, like solutions of hematoxylin.

Such are the reasons why I deem this solution of tropacocain to be the best means at present available for local anesthesia; I think it hardly necessary, however, to say that it is not free from the causes of failure or inconstancy that are inherent in the method itself.

CORRESPONDENCE.

AN EXPLANATION BY DR. GIBBS.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In the DENTAL COSMOS for June you notice in the “Review of Current Dental Literature” two cases in which I performed the operation of immediate torsion, and I regret that in commenting on one of those cases you have been so ungenerous as to have needlessly assumed that I have committed a gross act of malpractice. My sole object being to record the success of the operation, it did not occur to me to describe the circumstances attending it, but in view of your comments I now do so.

The patient was from the very slums

of the city, and never had used and never will use a tooth-brush. The enamel of all the erupted permanent teeth was defectively calcified, the right central having practically the whole labial surface involved, and the left being dotted all over with the opaque milky spots. The right lateral incisor was not extracted primarily to afford room for the rotation of the incisor—there being already quite sufficient space, as it was itself rotated nearly ninety degrees—but because I foresaw a crowded condition of the teeth in the future; and the enamel not only exhibited the condition of hypo-

plasia noted above, but there were deep fissures separating the lobes. I was sorry that the left lateral was not erupted, for I should have extracted it also, as the first premolar was only six millimeters from the distal surface of the central incisor, so that without expansion there would not be more than enough room for the canine.

Of the four permanent molars, one had been extracted, two were hopelessly carious, and the fourth was infected. The four mandibular incisors were very crowded and rotated, all showed enamel hypoplasia, and one was carious.

From a pretty considerable hospital experience of these cases, I am safe in the prognosis that by the time the patient is seventeen years of age he will have a mouth full of carious abscessed roots or will be wearing upper and lower artificial dentures; so that if any adverse criticism be deserved, I think it would be for having interfered in the case at all. However, although no attempt was made to regulate the mandibular incisors, I

know that the appearance of the child has been greatly improved, whilst the extraction of the lateral and the correction of the central incisors will probably prolong the life of the teeth considerably, and there will be just sufficient room for the right canine.

I am as fully convinced as you can be that the extraction of teeth for the purpose of correcting malocclusion is, as a general principle, a grave mistake; but we must treat each case on its merits, and in the lowest class of hospital patients, where the use of appliances, for one reason or another, may be out of the question, I do not hesitate for a moment to extract any tooth or teeth—whether sound or diseased—the absence of which I consider will be more beneficial to the patient than simply leaving the case alone—which, in many instances, would be the only alternative.

J. H. GIBBS,

F.R.C.S., L.R.C.P., L.D.S.Ed.

EDINBURGH, July 9, 1903.

A DISCLAIMER BY DR. FLAGG.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—While not desiring in the least to criticize the article by Prof. Wm. Crenshaw, D.D.S., commencing on page 623 of the August 1903 Cosmos, I would like to stop the further spread of such utterly erroneous matter as is contained in the entire paragraph which begins with my name.

It has been my good fortune to enunciate so much, to do so much, and to give so much to dentistry, that I feel well able to refrain from accepting anything not belonging to me; and it is not pleasant to find myself wrongfully accredited with what I have always regarded as the broadest, strongest, and most accurately truthful proposition ever made concerning operative dentistry.

When Prof. Henry S. Chase wrote to Dr. S. B. Palmer, during the framing of

the "New Departure" creed, that "In proportion as teeth *need* saving, gold is the *worst* material to use," I promptly received the contribution, and was as much impressed by it as was Dr. Palmer.

No other article in the "creed" was so exhaustively discussed as was that one, and so decided were all the members of the "Corps" as to its power that it was suggested to make it Article I in place of Dr. Palmer's contribution, which had been regarded as properly first because it was the germ of the organization.

In the presentation of this Article I in my speech in 1877 I was particular to say that I was "but a mouthpiece"—that "Dr. Chase has spoken to you," and thus in every way to give credit to whom, as I thought, great credit was due.

It was indeed a "memorable" state-

ment, and Professor Crenshaw's want of appreciation of it is shown by his adaptation of it to cohesive and non-cohesive gold—for the immense distance between the statement and the adaptation is such that it dispossesses them of any relativity.

Again, Professor Crenshaw continues the use of that much-abused word "indefinitely," and thus strives to give to the trifling period of "thirty years" the ability to decide upon the *permanent* durability of a certain class of work, while he ignores the fact that the saving more nearly of all textures of teeth by any one material has nothing to do with the memorable statement of Professor Chase.

And yet again, he continues his association of myself with this matter by suggestions of what I *might* have had "in mind" and finally leaves it as doubtful, to say the least, as to my ability to tell good work from bad!

It does not strike me that I have built much of my work upon any such sandy foundations.

As Professor Crenshaw seems to be impressed with the value of "linings," it might seem quite appropriate that he should have said of them "as first suggested, practiced and taught by Dr. J. Foster Flagg," and thus utilized my name correctly instead of attaching to it so much that does not belong to it.

J. FOSTER FLAGG.

PROCEEDINGS OF SOCIETIES.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-fifth Annual Meeting.

THE thirty-fifth annual meeting of the Dental Society of the State of New York was held in the assembly hall of the Hotel Ten Eyck, at Albany, N. Y., May 14 and 15, 1903. The meeting was called to order by the president, Dr. R. H. Hofheinz of Rochester, at 10.30 o'clock Thursday morning, May 14th.

After some routine business had been transacted, Vice-President Dr. W. J. Turner took the chair while President R. H. Hofheinz read his annual address, of which the following is an abstract:

PRESIDENT'S ADDRESS.

In the opening of his address Dr. Hofheinz feelingly referred to the loss the society had sustained in the death of four of its members, viz, Dr. Orville E. Hill of Brooklyn, Dr. Chas. F. Howell of Rochester, Dr. W. A. Campbell of Brooklyn, and Dr. Stewart B. Palmer of Syracuse.

After referring to the increase in the

number of members in the district societies—two showing a membership exceeding in number that of the parent society—he stated that, while an increase in the membership of the latter had accrued owing to the recent change in the basis of acceptance of members from the district societies, he believed that a still greater liberality in admitting to the State Society would be beneficial. That society should show the greatest number of members and do the best work.

He considered that a change was desirable as to the days of the week of the State Society meeting—making it the first or last two days of the week. At present the meeting-days necessitated the breaking up of an entire week. He believed the change would be appreciated and would induce a better attendance of members. He made the further suggestion that more time be given to the reading and discussion of papers, and less to

routine business, advising that such business be referred to an executive council consisting of one member from each district. A similar plan had proved quite successful at the Niagara Falls meeting of the National Dental Association.

The remainder of the address was as follows:

A recommendation which has been made by some of my predecessors, but which has never found grace either with the business committee or the society at large, is that of clinics. Clinics to a large number of the profession are like sceneries of a theatrical play. They often receive the greatest applause when the Shakespearean monologue is looked upon as self-understood.

All the gentlemen I met who attended the Chicago Odontographic Society meeting first spoke with enthusiasm of the number of clinics, and then said that it was a good meeting. A large number of men will only attend a meeting if it has clinics. They are not looking upon the intellectual feast an essayist expects to present to their minds as the main attraction. They want the digested food which expresses itself to them in the exhibition of clinical teaching.

These men should be attracted to our meetings and should be taught that the manual dexterity of the dentist is only a great factor in his success when combined with that intelligent companionship which expresses itself in a scientifically clear and concise method of thinking. Though clinical observations do not constitute a science, the clinical results must tell whether science is right or wrong in its practical application.

It is the same as with reason and judgment, of which Goethe says: "The reason has to do with things in the process of evolution, judgment with things evolved. The one does not vex itself with the question, For what purpose? The other does not ask, From what source? The one rejoices in the discovery of a cause, the other in the application of a result." Let us endeavor to combine the two into one great attraction for our meeting.

One of the proudest and greatest

achievements of the Dental Society of the State of New York was its collection within one-half hour of \$1000, for the purpose of assisting original dental scientific investigation. The suggestion, originally made by Dr. Kells of New Orleans, editorially approved by Dr. Kirk, and advocated by numerous members of this society, has found a practical and substantial expression. The subscription was the outcome of the report of Dr. H. D. Hatch, our able correspondent. His coming report will be looked forward to with much interest.

One thousand dollars in this age of billion-dollar companies is but a small amount of money, but it represents infinitely more in quality than in quantity. It will show other professions, and the public, that we are willing to bring a personal sacrifice for the sake of our intellectual betterment, and it will and must become a stimulus to other societies to do likewise, and it may thus prove the nucleus of a grand and far-embracing investment.

For years we have fought for the recognition of our diplomas in foreign countries; we have accused them of national narrow-mindedness and professional jingoism; and yet if any of our New York state graduates wish to practice in New Jersey, Pennsylvania, etc., his diploma is only recognized after conforming to the views of another state examining board, which compels professional intelligence to be judged without the proper broadness.

Why should foreign countries accept our diplomas as passports of our professional intelligence, if we do not trust each other? To quote Wilkie Collins: "Put yourself in his place." They are certainly under much less moral obligations to our educational views than one state of the Union is to another.

I would recommend to our Law Committee that it make an effort to bring about an interchange of the state licenses with those states whose requirements for matriculation are the highest and nearest to our own. Such accomplishment could only have a beneficial influence upon foreign countries, broaden our professional

conception, and compel the rest of the states to come into line with the necessary entrance requirements.

One of the usual and saddest topics the presidents of this society have battled with in their annual addresses, is the increased tendency to unethical conduct which finds its most frequent expression in illegitimate advertising. At numerous meetings I have listened to all sorts of remedies against this ever-increasing evil. Many have laid the cause at the doors of the colleges; it has always been difficult for me to see the question in that light. Be the cause what it may, the fact remains and the remedy is missing. I have given the matter much thought, both as a member of this society and as a teacher. All counter efforts thus far employed have proved in vain. The fact that dental societies have ostracized these unethical members has not prevented some of our best people from patronizing them. The moral chastisement has been lost on all. There remains nothing else, in order to stop this ever-increasing calamity, but the law. Dr. Ames has in one of his addresses recommended its employment. It was deemed unconstitutional. England has a law to this effect, and it reads something like this (from H. Lenmalm's "History and Review of Dentistry") :

"The General Council shall cause to be erased from the dentists' register any entry which has been incorrectly or fraudulently made.

"Where a person has been convicted either in Her Majesty's dominions or elsewhere, of an offense which if committed in England would be felony or misdemeanor, or has been guilty of any *infamous or disgraceful* conduct in a professional respect, that person shall be liable to have his name erased from the register.

"Any name erased from the register in pursuance of this section shall also be erased from the list of licentiates in dental surgery or dentistry of the medical authority of which such person is a licentiate."

Gentlemen, is there anything more infamous or disgraceful than such adver-

tising as disgraces our American streets and houses? England has recognized that the colleges are not to blame for the moral deficiency of man, but the individuals themselves, and has made laws to reach the individual. If the passage of a similar law is unconstitutional in this country, there still seems to be some other legal possibility. The colleges can be empowered by law to demand a relinquishment of the diploma of any holder thereof who engages in any such unethical conduct as he has vowed not to engage in before the diploma was granted. The granting of any diploma should depend upon the student's readiness to morally and legally bind himself to the rules connected with its acceptance.

I am not sure whether this might not also be unconstitutional. I have asked advice of legal talent, and they believe in the feasibility of my suggestion. At any rate this question is so important that the Law Committee should thoroughly investigate it. If also found unconstitutional, it would take away the only weapon I can at present see with which to combat this evil, until the general education of man instills a different degree of moral conception.

If found legal and practical, it will do away with the ulcer that is eating into the flesh of our profession. It will do away with the degrading influence exerted upon our scientific calling by this unfortunate commercializing of the profession—and I believe it exists more in our profession than in any other—and which impairs and threatens to destroy the meaning and importance of the professional individuality. Men would thus not only become mere machines, but minute parts of great machines. The inspiration to the individual would vanish, the reward for individual accomplishments would disappear.

We should use every influence and means to prevent the sinking of the individuality into the chaos of the general whole. It is this very individuality that forms the distinctive feature of professional life—that forms the bas-relief of our professional career.

Permit me to thank you for the honor

you have conferred upon me by choosing me as your presiding officer. Among the few qualifications nature has bestowed upon me, that of parliamentary ability is one of the very least. What I lack for my transitory life as president of this great society I will endeavor to supplement by an earnest effort to do my best, and by such enthusiasm as has always accompanied me in anything pertaining to a profession which I love, and a society of whose membership and of whose honors bestowed upon me I will forever be proud.

Dr. HENRY D. HATCH presented the following report:

CORRESPONDENT'S REPORT.

Mr. President and Gentlemen: Our by-laws say that it is the duty of the Correspondent "to open communication with dental, medical, and scientific societies, and with eminent dentists, physicians, and scientists in any part of the world, and report annually to this society."

As your Correspondent, my zeal, together with your hearty support and encouragement, has perhaps led me a little beyond the sphere described above. Some of the following matter originated with your Correspondent, whilst other parts are the report of your committee appointed to further the Carnegie Institution affiliation plan. So that the word "we" occurring here is sometimes used in the editorial sense and sometimes means the committee, of which Dr. Carr and Dr. John I. Hart are the other members.

As appeared by our report last year we were anxious to see the movement assume a national character, and while preparing the letter given below, which was sent to every state society in the Union, we were encouraged by the editorial comment of Dr. Ottolengui in the *Items of Interest* for June 1902, where he said among other things, "Thus far the fund is the private enterprise of the New York Society, but there is little doubt that the committee in whose care it has been placed would be glad to co-operate with other societies who might be willing to contribute. This method of raising

money is so simple, and so quickly succeeded at the Albany meeting, that we seriously suggest that the same plan be adopted at every state society meeting throughout the summer, and that the sums so raised be finally added together as a single fund, controlled by a committee composed of one representative from each society."

The following is the letter which was addressed to the president and secretary of each state dental society:

TO THE PRESIDENT AND SECRETARY OF ———
STATE DENTAL SOCIETY:

Dear Sirs,—At the May meeting of the Dental Society of the State of New York, the "Correspondent" presented to the society a report, in which it was urged that the time had come when financial aid and the co-operation of other scientific bodies was a necessity to the advancement of our profession along the lines of pure and applied science.

It was pointed out that our needs seemed to be fully met by the purposes of the Carnegie Institution at Washington, D. C., application having been already made for aid and co-operation from that institution.

Pending the first meeting of the Board of Trustees of the Carnegie Institution in the autumn, a committee was appointed by our society (and a fund raised by subscription) to further the work, and to undertake scientific research.

Will you kindly consider the matter at your society meeting, and appoint a committee (with a fund if possible) who might co-operate with our committee for the furtherance of this very desirable end.

The state committees could all work together in connection with a national committee, and in that way make the work symmetrical as well as national in its scope.

Also please consider the advisability of creating in your state society a permanent committee on "Scientific Work or Research."

Kindly favor me with your opinion and advise me of any action taken by your society.

Very respectfully yours,

HENRY D. HATCH, *Correspondent,*
and Chairman of Committee.

Owing to the delay in getting the advance sheets printed, this letter was not sent until after the June meetings of many of the state societies.

As it was, the District of Columbia and nine states responded cordially to the

letter, the following appointing committees:

District of Columbia—Drs. Wms. Donnally, M. F. Finley, and H. C. Thompson.

Ohio—Drs. J. R. Callahan, L. E. Custer, and J. T. Stephen.

New Jersey—Drs. C. A. Meeker and C. S. Stockton.

Rhode Island—Drs. Henry W. Gillett, W. P. Church, and D. F. Keefe.

Tennessee—Drs. L. G. Noel, H. A. Holder, and J. D. Towner.

At the meeting of the National Dental Association at Niagara, the president brought this matter up in his annual address, recommending the appointment of a committee of three from that body. The committee on the president's address, as well as our state committee, acting in conjunction with the other state committees present, submitted resolutions favorable to the appointment of such a committee. The appointees of President Libbey on this committee are Dr. Holly Smith, Dr. Wm. Carr, and Dr. Wilbur Litch, chairman.

To the hands of this able committee our committee have expressed themselves willing to leave the entire matter.

Your Correspondent acquainted the chairman of each state committee with the above facts, adding: "Our state committee has signified its willingness to leave the entire matter in the hands of the National committee. It would seem best, however, to maintain our state committee, so as to have someone in authority in each state, in case the National committee wished to confer with them, or in case the trustees could not be prevailed upon to aid us. Then your committee, as a committee on scientific work, could act in conjunction with the other state committees, thereby insuring co-operation along important lines of scientific research, while avoiding unnecessary duplication of work."

To those who have followed the movements of the Carnegie Institution, it is known that those in charge of that great fund have proved themselves to be very conservative and cautious—so much so, in fact, that they have been severely criticized in some circles, and when in a recent manifesto President Gillman as-

serted that as medical research had been otherwise provided for (evidently meaning the Rockefeller Institute for Medical Research), it—a medical research—would not be included in the Carnegie Institution work, we feared our project was doomed.

But a recent letter from Dr. Litch is very encouraging, saying in effect that progress is being made, that the president is interested, and that it will rest largely with our profession as to whether a man can be found who will fulfill the exacting conditions imposed by the institution.

We are confident that our profession will reach to the mark set for it, feeling sure that if an opening wedge is once inserted, and our profession recognized as a scientific class, other grants and facilities will be offered us.

Discussion.

Dr. JOHN I. HART, New York. I am sure that the consensus of opinion of those who understand what Dr. Hatch has done will be that he has built well. The enthusiasm developed at the last meeting of this society was of a character bound to lead to permanent results. That enthusiasm traveled from this meeting to the National, and I am sure that the energy of Dr. Hatch, supplemented by the National committee, will bear fruit, and when the National meets and we listen to the report from Dr. Litch we will all feel proud that this society has put this project on a practical footing.

Dr. M. L. RHEIN, New York. The society certainly has occasion to be proud of the result of the appeal that was made here last year for subscriptions to this fund, and the report that we have just listened to is a clear indication that the work is proceeding in a slow and sure manner. There is no question that it is necessary for a permanent committee to be put in charge of this matter, and that there is considerable work for such a committee to undertake. That such action meets with the approval of the society is evident from the contributions so freely given last year. It is somewhat disappointing that the committee has not

been able to increase this amount from the members of the profession throughout the state. I am confident, however, that as soon as some practical work is done, the committee may enter an appeal to the different members of the profession with the result that the work can proceed with all the facility that a large bank account will give to it.

Dr. C. W. STANTON, Buffalo. It was comparatively easy to raise the fund, but the work comes in developing plans for the proper use of the fund. There is nothing visionary about this thing; it is a reality, and I think we had rather go slow and get good results than be in a hurry.

Dr. A. L. SWIFT, New York. I do not know that I can add anything except to say that I consider with Dr. Stanton that we are moving in the right direction in being conservative. We have the matter in the best possible hands, and Dr. Hatch has undoubtedly done a great deal of work in carrying this idea forward, and I believe that there will be a crystallization of his efforts, with the help of the National meeting, in placing this movement in a position to go ahead and do positive work.

Dr. HATCH (closing the discussion). I am very thankful to the members for the many kindly expressions. My orig-

inal idea was that we simply affiliate with the new Carnegie Institution, making a national matter of it. That suggestion was made last year at the meeting of this society, in the report of the Correspondent. The raising of a fund at that time was an absolute surprise to me, and injected into the question a new element. The National committee now has under consideration the inducing of the trustees of the Carnegie Institution to give our profession a grant for research work. The committee has succeeded in interesting the president of the institution, and from what I hear, I feel sure that success will crown their efforts.

I have, as stated in my report, corresponded with all the state societies upon this matter. Of the several societies responding only one has raised a fund, and that a small one for clerical expenses, so that it now rests with our committee to use our small fund to the best advantage possible.

The change in the by-laws makes this committee a permanent feature in our society, giving them and their successors the custody and control of any funds, instruments, or appliances available for the prosecution of scientific work.

On motion the Correspondent's report was passed.

(To be continued.)

IOWA STATE DENTAL SOCIETY.

Thirty-ninth Annual Meeting.

(Continued from page 574.)

The PRESIDENT. The next thing on the program will be something from Dr. Wedelstaedt of St. Paul on "Cavity Preparation."

Dr. E. K. WEDELSTAEDT, St. Paul, Minn., then delivered the following address:

CAVITY PREPARATION.

I prepared an essay for your consideration, but have been requested to talk to you on cavity preparation. The subject is broad and very comprehensive, so I can merely talk to you of the funda-

mental principles, saying something also about the areas of liability, the outline form, the resistance form, the retentive form, the marginal form, and the convenience form. I will try and interest you in these six forms.

Several months ago one of my friends, who is a country dentist, visited me for three days. During that time we spent some hours discussing certain conditions pertaining to operative dentistry. When he came to bid me good-by, he said: "I cannot accept what you say regarding certain conditions. You tell me that decay spreads out in a fan-like way from the contact point, and that a certain portion of the approximal surfaces of teeth is an area of liability, but that portion of the crown which is polished by the food in its excursions is without this area of liability. I cannot accept this." I said to him, "Go back to your practice and study decay as it takes place in the teeth of your different patients, familiarize yourself with its action and progress, and, when left to itself undisturbed, just note how it acts."

Four days later I received a letter from him in which was inclosed an upper right first molar. This picture [illustrating] is fifty times the size of the tooth he sent, and fully represents its condition. In his letter he says, "The first operation I had on returning to my home was the extraction of this tooth. I have done little else than study decay as it takes place in the teeth of the different patients who consult me, and I now know what you mean. In each case that I have examined, where decay has been left to itself to go its own way, I find that the conditions are as you explained."

Now, gentlemen, this good man had not been studying the conditions with which he dealt. He tried to argue about things of which he knew nothing. But he is thinking now, and in future the standard of his operations will be somewhat higher than it has been in the past.

Look at this illustration; note how the decay on this approximal surface has gone on and on until that entire surface is involved up to the gum line and to the lingual and buccal angles.

Why did the decay end there? It did not; it continued within the tooth, but it left this buccal portion of the enamel, and this lingual portion, undisturbed—for the food in its excursions kept the portions of enamel just mentioned clean from the occlusal surface to the gingival margin—all this territory [demonstrating] between the lingual and buccal enamel margins, as is here shown, is the area of liability. Now I ask that you compare the conditions existing in this illustration with the conditions surrounding the amalgam filling some good man has made on the mesial surface in this molar. This molar must be all of 12 mm. broad linguo-buccally, and this amalgam filling is just about 3 mm. broad in the same direction. The cavity margins were within the area of liability, so decay took place around the cavity margins just the same as though that tooth were not filled at all. Just remember that when cavities like these in approximal surfaces are prepared and filled, if no change have been made in the environment, decay goes right on; for the cause which led to the original decay is still *in situ* and the conditions have not been altered.

Therefore I say to you that the more we increase our knowledge and familiarize ourselves with conditions of this kind which do harm, the greater is our worth to humanity. As we study and broaden our views, obtain more knowledge, we find there is much more to dentistry than seeing a hole in a tooth and filling that hole irrespective of the conditions with which we are dealing. There is a certain class of dentists who are forever saying things about our being specialists of medicine. I think we should be specialists of surgery. I think, in fact, that we are all dental surgeons. Dental operations and surgical operations have the same object in view. How can we outline our cavities in approximal surfaces if we do not have any knowledge of the area of liability? A short time ago I was invited to witness a surgical operation. I went to the operating room in the hospital and found the nurses just completing their final cleansing of the part to be operated

on. The surgeon went to his two trays of instruments, picked up his scalpel and turned to the patient. Turning the scalpel 180° he outlined with the back of the blade the incision he was about to make. After doing this he stopped and considered the area of liability, looked over his two trays of instruments, turned again to his patient and once more outlined the length and extent of the incision he was about to make. Turning the knife, he made his incision and went on with the operation. That man is a most successful surgeon and a man full fifty years of age, yet he always outlines his incisions, studies for one moment the area of liability, and thus prepares himself for what there is to come. I think it would be well for us to pattern after and follow the example of this very excellent man.

It is necessary for us, when dealing with cavities which take place in the approximal surfaces, to place the cavity margins where they can be kept clean by the excursions of the food, the tooth-brush, the lips and tongue. If we do not do this we shall have just such failures as took place here. But as we familiarize ourselves with the conditions with which we deal, and profit by our experience, we shall have fewer of such things to deal with. The more familiar we become with these conditions the more necessary we find it to be to extend our cavity margins as they have been extended in this illustration.

I trust that no one will go away from this meeting with the idea that we should prepare every cavity in approximal surfaces as the one here illustrated. This will not do. This particular cavity preparation applies to this tooth and the conditions surrounding it. Without a knowledge of the conditions with which we deal no one can state that such and such a cavity should be prepared so and so. Every cavity is a law unto itself and in preparing it the conditions surrounding it must receive every consideration. If this care be not given to every case that comes to us we shall some day receive a surprise like that of one of the surgeons in our city who removed an ovarian cyst

for one of his patients and in his hurry sewed a pair of scissors within the abdominal cavity. He won't do that again! Study each case, the conditions surrounding it, and then you are prepared to go on with that operation. Some of these approximal cavities are very large when they come to us. Others, again, we must make somewhat larger than they are. But there is no rule that will apply to all, any more than there is a rule for making laparotomies. In making these latter operations a surgeon does not open each patient from the pubes to the thorax, but when this is necessary he does not hesitate to do so. Neither should we at any time hesitate to do that which is right.

Now, just a few words about the resistance form. The resistance and retentive forms can be taken together. The two go hand in hand. We do not know what kind of retentive form to give a cavity until we are aware of the amount of resistance a filling placed within that cavity will have to sustain from the force of mastication. Study the occlusion of the teeth, study it with some care, and then you are in a position to know what kind of retention that filling should have. Years ago one of my friends brought a patient to me for examination. He had used 120 grains of gold in a cavity in the disto-occlusal surface of an upper right second molar. It was a beautiful operation. After examining it with some care I noticed that the patient did not have any lower molars, and until I took the dentist into my laboratory and told him so he was unaware that such was the case. He made me promise at the time that I should never tell this story. The man is dead now, so I do not think I have violated my word. He is not the only one who has had such things happen to him.

Now regarding the marginal form. On several other occasions I have spoken to you about this subject, and I feel very certain that you are familiar not only with the enamel rods but you are all well aware of the necessity for giving a proper bevel to the cavo-surface angle, so why

waste your time going over this subject again?

This naturally leads us to consider the convenience form. During the past year much has been said by men in different parts of this country about cavity preparation; in fact, nearly everybody seems to be interested in it. Some men have been criticizing other men for making their cavities convenient. Let me say to you, if we make our cavities inaccessible it is practically impossible to properly place our filling material. Cavities should be made convenient for us to place our filling material, convenient for trimming the filling to form, convenient for condensing the gold, convenient for polishing the filling material, and convenient so that it can be properly prepared. If all these things cannot be done we had better not fill the tooth.

Perhaps I can better illustrate this by relating another story. At our 1897 postgraduate school one of the operators asked me to pass a cavity preparation. He had prepared a cavity in the disto-incisal surface of an upper left canine. He had opened the cavity from the lingual surface, leaving the entire labial plate of enamel standing. As I looked at this cavity I felt very certain the young man had used a brush wheel and wet pumice, and that for some time, for the preparation was the most beautiful I had ever seen in my life. I passed the cavity preparation and told him to place his filling material. No man living could ever have filled that tooth successfully as he had it prepared. I noticed that he was a young man whom it was well to let alone, so I complimented him on the cavity preparation and started away. But he caught me by the sleeve and asked if I would prepare the cavity in that way. I told him No, I should have made it more convenient. I then asked him how he was going to place his gold. He said he had never given that part of the operation a thought. He had devoted all his time to obtaining a beautiful cavity preparation. This he had obtained, but it was useless! He was taught how to make his cavities convenient for the placing of filling material.

I have gone over this subject with a good deal of rapidity, saying a few words on each topic and trying to interest you in studying conditions with a little more care. Would that we could get our experience in one great big lump. But such is not the case; we get a little to-day, a little to-morrow, a little more next week, and so on, and all these little bits added together make in their aggregate the sum total of our definite knowledge.

I do not anticipate that you are going out of here and being able to instantly recognize the form of the area of liability. But I hope that, from what I have said to you, you will return to your homes and study these different things, and gradually you will find that more and more light will be shed on the subject. It may be very little at first, but after that little comes, more will follow which will be the means of assisting you increasingly in your daily labors at the chair, and this will make you of greater worth to humanity.

Discussion.

After various remarks in commendation of the paper had been made,

Dr. WEDELSTAEDT closed the discussion as follows: Permit me to thank you for the many kind things said and the cordial way in which you have received my talk. It is very true that we have all missed the vital points in much of our operating, and it should be remembered that, if we did do so, we cannot learn everything at once. It should also be remembered that we are a young profession and much remains for us to learn. This simply covers the last statement I made to you—we learn just a little here and a little there. It may be perhaps just a little insight, but if we take these things into consideration and study them and add them together we shall quickly find that in the end they constitute our definite knowledge, that of which we are certain. Why, we do not learn the form of the area of liability at once!—it does not come to us in one great heap.

Now let me speak to you for just a moment about the form of the area of

liability. Take it, for instance, in the mouth of a man who smokes a great deal: If you will examine the lingual surfaces of the teeth in such a mouth you will notice in one instant where the food in its excursions polishes the crowns of the teeth. You will notice this more perhaps toward the lingual than toward the buccal. You will also notice that the form of the area of liability is entirely different in the different teeth. It is not the same in all teeth. Note this difference when you prepare your cavities in the approximal surfaces, and take advantage of it.

There are two things which I wish to emphasize. The first is the necessity for all of us studying with more care the conditions which lead to decay of the teeth. If there be no change made in the conditions which led to the decay of that tooth [demonstrating], why, what is the object in our filling it? What I am saying has particular reference to cavities which we prepare and fill in the approximal surfaces of teeth. The cavities should be so prepared and extended that there is a change in the conditions. Let me say that this does not mean that we are to include the entire approximal surface within our cavity margins. It means that we are to use some intelligence in preparing cavities. Sometimes it may mean one-third of the approximal surface, again one-half, and still at another time two-thirds of that surface. It does not mean that each cavity we prepare in an approximal surface is necessarily cut two-thirds as broad as the tooth is thick, for the reason that no two cases are identically alike. Remove the cause which led to the first breaking down of the tooth and then keep on cutting until there are changed conditions.

The next thing that I would wish to mention is the subject of gold and amalgam fillings. I said nothing about them in my talk to you, but I wish to say this: There is a place for gold, and a place for amalgam, and we should not confuse their uses.

The subject was passed, and Dr. A. M. LEWIS of Austin, Minn., read a paper of which an abstract follows:

EXTENSION FOR PREVENTION AT GINGIVAL MARGINS IN APPROXIMAL CAVITIES.

This is a subject of great importance to the present practitioners of dentistry. I do not think I have the percentage too high when I make the statement that ninety-five per cent. of those who think they know something about it fail to follow their convictions when they prepare the gingival margins of cavities. Dr. Black tells us that "Fillings placed in the approximal surfaces of molars and bicuspid should have the gingival margin covered with a healthy gum septum." Practically this rule holds good with the six anterior teeth. For the past year I have made an examination of a large number of gold fillings placed in the six anterior teeth, and I found that many practitioners had made a great mistake when they prepared their cavities in the approximal surfaces. The fillings as I observed them were of an oval form, particularly at the gingival margin. In a large number the gingival margin extended somewhat under the free margin of the gum, but the lingual and labial gingival angles were unprotected, and recurrences of decay had taken place at these angles. They had not taken Dr. Black's rule, "cutting freely toward the gingival line, broadening into angles labially and lingually to self-cleansing lines."

At this point I wish to call attention to Dr. Darby's essay in the *Items* for May 1901. Dr. Darby protests against extension at the gingival margin, he does not believe there is an advantage gained by this procedure. He says, "Take the average incisor which has been well filled upon its approximal surface: where do you find recurrence of decay, if it has occurred? Is it at the gingival? No! In nine cases out of ten it is along the lingual or labial border near the gingival." Now, does not this contention of Dr. Darby's prove the truth of Dr. Black's statement? Nine out of ten of the fillings that Dr. Darby examined, where decay recurred at the angles, were prepared according to the oval method;

nine out of ten that we see that are decayed at the angles have been prepared in this way. The reason that they are not decayed at the gingival is because that margin is covered with a healthy gum septum. The angles, which are vulnerable points, were left exposed and decay took place. If these cavities had been prepared correctly and cut broad labio-lingually at the gingival and to self-cleansing lines, decay would not have taken place. From the age of fifteen to thirty a properly prepared cavity on the approximal surface of the front teeth will extend slightly under the free margin of the gum, along the gingival border, and at the gingival angle. In this statement we are misrepresented by those who misunderstand and misconstrue principles of extension for prevention. Statement after statement has been made in dental magazines which gives the reader the idea that we advocate and practice extension gingivally to such an extent that no matter how much recession of the gums has taken place, the filling will still extend under the free margin of the gum. Nobody ever advocated such a method and no sane man ever believed or followed it.

I do not believe that it is necessary to extend the gingival cavity margin any farther gingivally than a properly adjusted rubber dam will permit, and this will still give room for finishing the filling. But there are some exceptions to this statement. For example, when considerable recession of the gums has taken place it would be folly to extend the cavity margin so that the gingival portion of the filling would be covered with a gum septum. This method would not preserve the tooth any better, for as a rule when considerable recession of the gums has taken place immunity follows. Next, if a cavity was so extended it would increase the pain of preparation because the preparation would often extend to the peridental membrane covering the root. And last of all, it would be difficult to finish such a filling properly.

While in the East this summer, I discussed methods of cavity preparation with a number of prominent dentists.

I was somewhat surprised to hear them advocate "cutting gingivally to sound tissue only." Among the dentists with whom I discussed these methods was a prominent dental educator, and he told me that "a perfectly filled and finished filling would not decay at the gingiva or gingival angles provided the patient returned to him every six months for examination, and this his patients usually did." On another occasion a gentleman said, "Doctor, I cannot sacrifice good sound tissue for that whim, and the suffering caused by the rotating of a large round bur to accomplish this would drive the patients from my office." Here is a mistaken idea. It seems to be the opinion of too many practitioners that the only way to accomplish extension is by means of a large round bur, instead of a small inverted cone, which will very quickly undermine the enamel, and when followed with a few cuts of a sharp hoe will place the margin just where it should be. The round bur has its place, but its use is limited when we are preparing cavities according to the methods of Dr. Black. The Cosmos recently contained an essay the writer of which advocates the use of the round bur almost exclusively and can see little use for the inverted cone. If I am to judge from the ideas expressed in his essay he is not very familiar with the value of certain methods of cavity preparation or the use of certain instruments.

A word in regard to cavities in the middle third of the anterior teeth. Take for an example teeth that are long and narrow with a cavity involving one-third of the approximal surface at the place designated. All of us would extend the cavity a little beyond the contact point, but how many of us in our own practice would put a question mark on the extension gingivally! Let me say to you that where this extension is not made it is a grave mistake, for it is but a moment's work to make this all-important extension, and this measure transfers us from questionable to solid ground. I might compare it to an evangelist whose name was Brown and who was holding revival meetings in a neighboring city. He

was trying to convert a young man who wished to be a Christian but who could not believe there was a hell. Brown said, "Young man, don't take any chances! Come with me, and if there be a hell you will miss it; if there be not, you will not be out anything." I think it better for us not to take any chances. If decay should take place you will miss it; if it should not take place you will not be out anything.

Discussion.

Dr. MONFORT. I have in my mouth two approximal fillings—one of these is in a central and one in a lateral—small fillings that were put in when I was about twelve years old. There is no extension for prevention in that case—and I am very glad of it, as long as I have the teeth in good condition now—for when I had the fillings put in they did not have the extension for prevention theory very strong.

Perhaps mine is an exceptional case. Now, as I have said before, Dr. Black, in his theory of extension for prevention is setting for us, as a profession, an ideal which we are expected to follow and attain that ideal as near as possible. Of course there are a great many cases that come to us where I think it is impossible to carry out this ideal cavity preparation.

Dr. E. D. BROWER, Le Mars. For years I have aimed to follow Dr. Black, as far as I could. I do not believe that I have got quite down to work yet; however, I think it is the right method of operating. But, of course, a great many of us, at first, are mistaken in the extent that Dr. Black and Dr. Wedelstaedt intend that we should do our cutting.

Dr. GRIFFITH, Atlantic. There is one point, and that is with reference to the gingival line. In some cases it is difficult to remove all the decay without extreme pain to the patient. Now, if we have a cavity of that kind, one essential point, I think, is to finish it perfectly. I have known several cavities that I thought were undoubtedly properly prepared and the decay all removed, but on further examination found it was not

properly finished. Now, many have asked how to finish those. Some years ago, I recall, they recommended using the concave disk, and this method I have endeavored to follow. Now, it seems to me that the failure to finish this cavity is in not removing the decaying particles.

Another thing that will assist very frequently to do this work is to take plenty of time to finish the cavity, and charge your patient for it.

Dr. A. M. LEWIS (closing the discussion). I shall answer the gentleman in the rear of the room (Dr. Griffith) first: I will agree with him in regard to the necessity of perfectly polished fillings at the gingival margin, but I cannot agree with him in the method he uses to finish them. I should advise him and every one here to discard the concave disk when finishing the gingival margin; in using it you would cut away the contact point, and with this gone the interproximal space would be closed.

You may ask, How would you finish the gingival margin? If any of the gentlemen here have not a Black's saw-frame, let me say, get one. Then buy a dozen Kaeber saws, usually those that cut on but one side, place one of these saws in the frame with the cutting edge in. Draw it tight, and grind it on the lathe to about one-fourth its original width. (If any of you would like to see a Kaeber saw ground, I would be glad to show you.) Place the saw through the interproximal space below the filling, the cutting edge toward the occlusal surface. You are now ready for the frame; place it in position and tighten the saw. With this in position remove the surplus gold, working the saw from the gingival margin toward the occlusal surface, but using care not to cut away the contact point; then with Black's or Wedelstaedt's trimmer shape your filling, and finally finish the gingival margin with fine strips. Then, when you think you are through, take an explorer or one of Black's knives and find out if your margin is perfectly smooth. If you find an overhanging margin remove it and re-polish with a strip.

In regard to Dr. Monfort's remarks: If I understand him correctly, he considers the filling in his own mouth as exceptions to the rule. I think they are; small fillings in the middle third that are not extended gingivally so as to include the area of liability are very apt to re-decay at the angles, especially in young people from the age of twelve to twenty-two.

I had a case in my practice not long ago. The gentleman is now interested with me in business. I made two gold fillings for him about eight years ago in the centrals approximating each other; the fillings were not extended, but occupied about the middle third; decay has recurred at the labial angles in both fillings. If these had been extended to include the area of liability decay would not have taken place.

I want to call your attention to this illustration [demonstrating]. We have here a case of long and narrow teeth;

this is the enamel line and this the gum septum. The gum septum in a perfectly healthy patient of about twenty-two years of age usually extends to the contact point or just below it. Dr. Wedelstaedt informed me that in one hundred cases he examined on the mesial surface the contact point occupied the mesial third, the gum the gingival third, and the middle third was free, subject to the ravages of decay. Let us return again to the illustration. Suppose decay has taken place at this point, the middle third; instead of making a small filling that is apt to re-decay at the angles, extend it beyond the contact point incisally and gingivally so as to include the area of liability; it may extend under the gum and it may not, it depends on the condition of the gum septum; and you will find that instead of temporary you are doing permanent work.

(To be continued.)

NEW YORK ODONTOLOGICAL SOCIETY.

Monthly Meeting, April 1903.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, April 21, 1903, at the Academy of Medicine, No. 17 West Forty-third street, New York city, President Hodson occupying the chair.

The secretary read the minutes of the last meeting, which were approved, and after the transaction of some further routine business the meeting proceeded to the consideration of

INCIDENTS OF OFFICE PRACTICE.

Dr. PERRY. I am very glad of the opportunity to have Mr. Leaming, who has been working in my laboratory for a long time, give an exhibition of a method of baking porcelain inlays which is simplicity itself, and which would, I think, be as successful in the hands of others

as it is in his. Mr. Leaming uses a platinum thimble, as it might be called, in the ordinary gas flame, with the ordinary blowpipe. He will bake an inlay in a few minutes in as perfect a manner as any I have seen. This method is entirely original with Mr. Leaming, and I think he is entitled solely to the credit of it. I take this opportunity of giving him such credit.

A short recess was taken to permit Mr. Leaming to demonstrate his method.

The meeting was then called to order again by the president.

Dr. PERRY. Gentlemen, Mr. Leaming has made an inlay on the corner of a tooth, filling it out; you can see the character of it. It is not an ordinary inlay with walls all around it, but a corner built out.

The PRESIDENT. Gentlemen, have you anything to say in regard to this?

Dr. WM. JARVIE. That demonstration proves very conclusively that it is not necessary to have an extensive electrical furnace, or an expensive outfit of any kind, to make these inlays, because the inlay that has been made to-night, in a few minutes, is most beautifully fitted and adapted to the place for which it is intended.

Dr. WALKER. Was that high- or low-fusing body?

Dr. PERRY. White's high-fusing body. I want to repeat that a great deal of my work is done without burnishing into the tooth, simply giving Mr. Leaming the impression. He uses three thicknesses of shellac varnish, which makes up a little for the space occupied by the platinum, so it fits a little more closely than if no shellac were used. Mr. Leaming makes a little matrix with plaster, which he boils in stearin, thus hardening the edge, and sends me the finished inlays, and they always fit as well as that. When I want to be very careful, I take the precaution of burnishing in the usual way in the cavity, but most of them I never see until I am ready to set them. I give him the impression and the color, of course. I have taken the impression with red impression material, with sealing-wax, with gutta-percha sometimes, and often with a preparation called "dental lac."

Dr. LEROY. This reminds me of a demonstration given in Chicago at the meeting of the Odontographic Society in February last. The gentleman giving the clinic used a Bunsen burner and an ordinary blowpipe. Of course he did not use a high-fusing porcelain. His method for the making of the matrix was to take an impression of a cavity with "archite"—it will take a very sharp impression of a cavity. When that was hardened he removed it from the tooth, making sufficient bulk behind it by placing it on impression compound and allowing that to harden in place; then, taking platinum, about 40 gauge, and a piece of ordinary black or red vulcanite, he placed all in a little crown-swaging

device—the archite impression, the platinum on that, the rubber over it—and with the plunger drove all into place. He obtained a very good matrix of the cavity in this way. He used the ordinary sheet rubber unvulcanized. It will be readily seen that the platinum matrix would represent the margins, or, if we can call it such, the external periphery of the cavity, and not the matrix representing the internal periphery of the cavity with the platinum in position. He contends that with his method, when the inlay is finished a more accurate inlay is the result than with the platinum burnished into the cavity. He reinforced the platinum subsequently for the purpose of stiffening the matrix by taking a piece of fiber gold (or any of the crystal golds would do)—a little mass of it—and laying it on top of the platinum before separating it from the archite, he then repeated the swaging, forcing that into position, and removed the archite without any unusual care. The inlay was next fused into that, using a Bunsen burner only. He fused several times where the inlay was large and required it. He showed finally that he had a most beautiful fit, due, I presume, to the fact that the platinum was swaged up to the impression of the cavity.

Dr. MEEKER. What prevents the archite from sticking to the cavity.

Dr. LEROY. A little vaselin.

The PRESIDENT. Is the gold removed?

Dr. LEROY. No; that stiffens the matrix.

Dr. STOCKTON. I am induced to ask a question: There is no doubt about the artistic part of inlay work. If you take an impression and the tooth must be cut away so that the impression will come out readily, what prevents (except of course the little cement that is there) the entire inlay from coming out? It is put in just as the impression is made. I would like to know from Dr. Perry, from Dr. Van Woert, and others, the probable life of such a piece as we saw to-night. That is a practical case—made, I suppose, from some case in Dr. Perry's practice; will that live the life

that we expect? Yesterday afternoon I took out a tooth that had loosened—a central incisor, where the point had been broken off considerably; I filled that thirty years ago with gold, and it is as good as the day I put it in. Will this porcelain work stay in? There is no question about the beauty of it, but will it stay?

Dr. WALKER. After the platinum has been peeled off the inlay, that surface is treated with hydrofluoric acid to remove the gloss; then you take a thin copper disk and cut grooves in the inlay. These grooves retain the cement and you can also make little pits in the cavity to keep it in. The larger the inlay, the better it will stay. I do not know how Dr. Perry prepares his.

Dr. PERRY. I think Dr. Stockton's inquiry is a very pertinent one. I have had quite a number of unfortunate breaks, and to have one break off and not be able to get it out is rather embarrassing. I have a patient who lives up-town, for whom I have tried to dig out an inlay which broke through the center. I presume the makers of artificial teeth have some manner of making the porcelain as strong as possible, and I think that point has not been much thought of by porcelain workers. To-night Mr. Leaming cooled his inlay off as quickly as possible. Whether that is good for the inlay, I doubt. I do not know what we can do to make the porcelain inlays tougher. I think we are going a little bit fast. It is very pretty to look at, and makes beautiful work, but I do not think it can be compared with first-class gold work for durability. I do not venture myself to make many approximal inlays for the back of the mouth; I am biding my time. I am making them in the front of the mouth, where I have to regard the appearance and the expression, but I do not make them to any extent in the back of the mouth, where I can use gold. The brittleness of some of them is amazing. The inlays made by Mr. Leaming fit very closely, and it is sometimes a little difficult to get them in. Once I had one fit so closely that I had difficulty in getting it out again.

Sometimes they fit so well that the edges chip in getting them in.

Dr. FREEMAN. Speaking of taking the impression, I would like to call the attention of the gentlemen to the use of a little tin foil, using it just as you push it in—lining the cavity. If you use that, you get the effect that Dr. Perry speaks of, for which he uses shellac, and in addition it gives you a clean edge.

Dr. TRACY. Mr. Leaming's method has brought out considerable discussion, and we would like to hear any criticism the gentlemen have to make. Someone suggested the possibility of gassing the porcelain with this method.

Dr. PERRY. It seemed to me that would not be possible, because the flame does not go in the thimble but just goes by. I have not seen any difference between those made in this way, and those done in the electric furnace. The flame never touches the inlay at all. You will notice the ingenious bit of asbestos on the top, and how Mr. Leaming lets the flame go under there.

Dr. VAN WOERT. I have been very much interested in the discussion on porcelain inlays. I think I may safely say that, for a man opposing porcelain, I do as much of it as anybody living; but I cannot believe now, nor have I ever believed, that porcelain could take the place of gold, so far as its wearing qualities or the salvation of teeth are concerned; neither do I believe that it is necessary to cut away a large part of the tooth to get a draught on the inlay. I think that can be accomplished with undercuts with just as good results, because the strength of the cement is the prominent factor in the retention of an inlay, in any case. If the adaptation of the inlay to the margins of the cavity is as it should be, I think the chances are very largely in favor of its standing for many years.

Speaking of the forming of matrices from impressions taken from teeth, if Dr. Geran (now dead) were here he would tell you about the instruments—and I can show you them in my office—which he devised for the making of impressions of cavities with shellac and sealing-wax,

and that I used in the early stages of porcelain work. I have heard a great many arguments as to the feasibility of it; some of the best men in the country have said it was not practical, and on the other hand others equally eminent have used it. In many cases it has great advantages, and in others it is worthless. To-day I do not think we can do better than use the method and the body introduced by our good friend Dr. Jenkins. I was one of the strongest advocates of high-fusing body and of platinum as a matrix material, but I am a good deal like the old darky's mule when the darky stood him tail end against the cast-iron man; the mule kicked once, and said he had had experience, and wouldn't kick again. I have had my experience and I get better results with the Jenkins body in an electric furnace than with anything I know. That does not detract from the demonstration you have had this evening. If you ask, What advantage has this over the electric furnace? what can you say? Only one thing—that it is cheaper.

A MEMBER. It is quicker.

Dr. VAN WOERT. Not at all. If I cannot fuse an inlay quicker in an electric furnace than that, I will give you the whole outfit.

Dr. WALKER. It is a good thing to have if the muffles burn out.

Dr. VAN WOERT. But the muffles do not burn out. With a Hammond furnace I never had one burn out yet with one button, and I can throw it up to the fourth or fifth and it does not burn out. I am not fighting for the Hammond furnace or for any other; I do not believe there is to-day anything better than the new Custer furnace, just put upon the market, because it has an arc light behind it, by which you can see the body and see what you are doing. I would like to demonstrate, beside any methods you can bring forth, how quickly an inlay can be fused. It can be done with the McBrair or the Hammond or any other. You can do with the Jenkins body what you cannot do with any other body. You obtain a translucent inlay that you can polish and make more like

the tooth than you can with any body you have to-day. I have no interest in it whatever. I have stood and fought for years. Go over the Transactions of the Northern New Jersey Society and others, and you will see where I fought porcelain work on general principles in the first place, and afterward because I thought nothing but the high-fusing bodies would answer. I have had experience, however, and now I believe the Jenkins body is the one *par excellence*—I don't care what it is. As to the furnace, make one yourself if you like. If you cannot get electricity of course it is different; but if you want something you can swear by, you must have the Jenkins body and the electric furnace. Watch and see if that is not so.

Now I have another matter to speak about. Our president, Dr. Hodson, and Dr. Gillett, have induced the Johnson & Johnson people to make some points for drying out root-canals that have given me more satisfaction than anything I have known for years. They are so practical that I thought it would be a good thing if they could be turned to other uses, and I prepared some with crystallized carbolic acid, and some with iodoform, for the dressing of root-canals in pulpless teeth. The crystals of carbolic acid are warmed in small pieces and the points are merged into them; when taken out to cool, they are as stiff and hard as they were originally, and they can be carried into a pulp-canal with ease.

Dr. PERRY. Don't they swell?

Dr. VAN WOERT. Not as far as I know. They are made of a preparation of cottonoid, I think. This bottle contains some saturated with iodoform. I know that many gentlemen present object to that, but, notwithstanding, we have no better remedy to-day. If we can use iodoform without the objection of its odor, we have an exceptionally good dressing for putrescent canals. When the points are saturated with the iodoform, as they are there [taking one from the bottle], there is so little odor that the patient will hardly notice it. That simplifies the treatment of putrescent canals very much. I think the

points worthy a very prominent place in the medical cabinet, and I would feel very loath to abandon them.

The PRESIDENT. The part that Dr. Gillett did was to sterilize them and show them at our January clinic.

Dr. WALKER. By medication I am afraid they would become so soft that they could not be used for the purpose indicated. To use them in that way they would be practical for only such cavities as were easy to get at.

The PRESIDENT. It is necessary in introducing them into any pulp-canal in the mouth to handle them with long pliers—never under any circumstances attempting to use them alone, as I have seen some people do. I have seen some men use them with their fingers. Take them with the pliers and have the point of the pliers within an inch of the end of the paper point, and they can be carried nearly as far as a broach can.

Dr. H. P. GOULD. Does Dr. Van Woert use any essential oils or other drugs to conceal the odor of the iodoform?

Dr. VAN WOERT. I do not see the necessity for it. Take one of these points, and I doubt whether you can detect the odor.

Dr. GOULD. Why not use a little oil

of cloves, or something that is not so disagreeable as iodoform?

The PRESIDENT. I understood Dr. Van Woert to say that any material could be applied to the points. He says he has carbolic acid in one bottle and iodoform in the other, but any material could be used that was desired.

Dr. VAN WOERT. The only object is to have them medicated for ready use. Any medicament could be used.

Dr. LEROY. I wish to say a word about iodoform. Recently a patient presented with the crown of a tooth gone and the pulp-chamber exposed. In that was a filling of iodoform and cotton. Although it had been exposed to the action of the secretions of the mouth for a week or two, the iodoform had remained intact. It had been there for a good many years, because the pulp-canals were filled long before the patient came to me; the lady has been a patient of mine for twelve or more years. I simply call attention to the permanence of iodoform—even for that length of time, and after exposure to the secretions of the mouth.

Dr. WALKER moved a vote of thanks to Mr. Leaming and to Dr. Van Woert. The motion was carried.

Adjournment.

ELLISON HILLYER, D.D.S.,
Editor N. Y. Odont. Soc.

CONNECTICUT STATE DENTAL ASSOCIATION.

Thirty-ninth Annual Convention.

(Continued from page 637.)

TUESDAY—*Evening Session.*

The meeting was called to order at 8.30 o'clock by President Eberle.

Dr. I. N. BROOMELL of Philadelphia, by the aid of the lantern showed some beautiful specimens of sections of the jaw made by himself to illustrate the development of both the temporary and permanent sets of teeth. He showed the

earliest forms of the tooth-follicles in their embryonic stage and followed out the development of the teeth to their eruption. He also showed the absorption of the roots of the temporary teeth and the development of the permanent teeth from the early stages to eruption. Dr. Broomell showed slides illustrating the comparative anatomy of the teeth of man to the lower animals.

There being no discussion of Dr. Broomell's lecture, the society then listened to a paper by Dr. WM. H. METCALF, New Haven, Conn., as follows:

NERVE LESIONS: THEIR ETIOLOGY FROM
A DENTAL STANDPOINT.

In presenting to you so broad a subject it is incumbent upon me to explain that, owing to the time limit of such a paper, it must necessarily be treated synthetically and not strictly from the point of view of the scientist, be he anatomist, physiologist, or pathologist.

The investigation of the collateral sciences and their many and varied ramifications best serves the student through the medium of his own particular specialty, therefore it seems to be our mission as dentists to dissect this subject principally along the lines of dental experience. No profession, perhaps, offers better facilities than ours for such investigation; in fact, I might truthfully say that, working as we do upon subjects who are comparatively healthy as well as upon those who are diseased, and coming into such close contact or association with the nerves of sense and feeling, we have thrust upon us most exceptional opportunities for scientific as well as artistic research. The proof of this is manifest when we reflect upon the rapid advancement of dentistry as a scientific profession, and upon the many improvements in its methods of practice. Yet, gentlemen, how true the old aphorism, "There is nothing new under the sun," for we are, after all, not inventors, but mere adventurers; not originators, but explorers—discovering, or unraveling, as it were, Nature's beautiful fabric and striving in this way to understand her methods of weaving; alas, how unsuccessfully!—for do we not, in our inspection of the woof, often entirely forget the warp, thus totally destroying the design?

To get a more intelligent conception of nerve lesions, and to more accurately trace their intricacies and complexities, we should first look for a moment into the apparent nature of normal nerve structure or force, beginning our pilgrimage at the cell.

The normal tissues of the body are made up, as it were, of cells, or groups of cells, each tissue having its characteristic group. Nerve cells respond to stimuli through the afferent system. These stimuli all act as irritants, and are classed in our physiologies as mechanical, chemical, thermal, and electrical; the latest theories including also a force or influence emanating from the will.

These cells hold "stored energy," and are so constructed or organized that they will readily respond normally to stimuli. When stimulus is more than normal the vital force of the cell is exhausted, and the converted energy fails to react. On the other hand, when stimulus is less than normal, as in the case of a structural defect interfering with physiological action, the result is invariably a lowering of the stored or potential energy of certain groups of cells, directly connected, and sometimes in a reflex way with the lesion. In other words, the power of resistance of a cell depends upon its structural relations with its fellows, any defect of continuity, of course, lessening its power of storing vital force and giving off its converted kinetic energy. Yet this same kinetic or resultant energy, if normal, may be, or is, an occult force in nature, which supplies new energy through waste, as the earth gathers momentum, perhaps, in its endless journey through space, or as the wheat germ will spring into life and growth, after a dormant existence in some sarcophagus for a thousand years. Briefly, to give metabolism the attributes of perpetual activity and life negatives the essence and meaning of both its name and functions. That is, if we agree that anabolism means the building up of the body elements, and katabolism the breaking down of certain elements during the changes preliminary and incident to assimilation and nutrition, then, as death ends the process, we are compelled to admit the cessation of an outside dependent energy, which seems to prove the supposition. Granted, then, that the vital essence or principle comes from outside the cell, it goes without saying that the cell is formed for the reception of

that force, and not the force for the cell. It would surely sound better to say that man was made to receive the Divine love and wisdom than to reverse the proposition. The cell, then, being made to receive and operate this outside energy, it follows that it must be of normal size and shape and in perfect working harmony with its surroundings; when it is not, we speak of the condition as disease, or abnormal anatomy, and if you will pardon the term, perverted physiology.

Nerve lesions, then, are pathological, and their etiology embraces two causes, which may be classed as internal and external. As dentists the external causes concern us most, for of the nature and working of internal causes, advanced medical science has as yet shown us but little that is of use.

Insanitation is perhaps the best word to express the nature of outside causes of nerve atony. This includes uncleanness, and admits the presence of the much dreaded micro-organisms. Malnutrition is, I presume, the most appropriate term to express the internal causes.

We have, then, in the cursory scanning of the field, noted that when the causes of nerve lesions are from within, metabolism should be promoted, and a condition of perfect nutrition should, if possible, be established. If from without, then the most modern prophylactic, disinfectant, and antiseptic measures of sanitary science should be adopted.

It occurs to me at this point of my reading that I may possibly be misunderstood when making the statement that nerve lesions are the result of perverted physiology or disarranged anatomy, for this would imply accident, and this is of course not always the case. Disease not always, but generally, involves a question of individual responsibility. The human body is a personal trust, and when function is abused disease finds easy entrance. To avoid disease then, or nerve lesions, we must not only look for abnormal anatomy but for functional disorder as well, for it is the latter which the most frequently brings about disease. Each human body needs an engineer with a well-balanced judgment to run it prop-

erly. Many errors of the past treatment of disease or of lesions may be laid, I think, to the non-belief in this personal responsibility theory—namely, that every man is the arbiter of his own physiological and functional economy. The dentist should be a doctor in the full meaning of that term—a teacher and a counselor. In other words, he should endeavor to show his patients that disease is not an entity, but the absence of health; that the human machine is made to respond to intelligent management with normal functional activity, and that abnormal functional activity exhausts and deforms the organ.

Then again, while the individual is practically the architect of his own destiny, he nevertheless is but an atom in the great sea of humanity, and must necessarily be, to a great extent, influenced by the condition of the whole. It behooves us, therefore, in exercising the personal care and responsibility for health, to also do our best to educate our patients and the masses into the correct ways of thinking about themselves, and their wonderful privileges and possibilities.

But I can seem to hear some of you say, How about the practical side of this question of nerve lesions, that side which concerns us as artisans and mechanics? How about the nerve lesions in and about the teeth?

Gentlemen, after all, this is the question which concerns us the most, touches us the nearest. Many of you have been practitioners much longer than I, and without doubt have noticed and noted more; but after about twenty years of dentistry, I have come to the conclusion that the many disturbances connected with tooth-structure and their etiology may be summed up as almost invariably coming from one cause, viz, early neglect; or, in other words, that the teeth of children have not been scientifically cared for.

Beginning at the cradle, with proper food, correct environment, and hygienic care, the deciduous teeth should be saved, if possible, until the eruption of the permanent teeth, thus making nerve lesions

and abnormalities much less likely to occur. It seems to me that the coming study for both dentists and physicians is physiological chemistry; not that which has direct reference to drug effect, or therapeutics in the medical sense, but the true animal chemistry of the body itself, as it demonstrates itself through normal and abnormal glandular action, cell proliferation, assimilation, nutrition, and metabolism.

One of the many causes of malnutrition of the second or permanent teeth is, I think, the premature extraction of the first teeth. Think for a moment of the delicate adjustment, arrangement, and *modus operandi* of nature in the cutting, or eruption, of the permanent teeth! Think how volcanic, how traumatic, how iconoclastic, the brutal extraction of the baby teeth must be! How it must suddenly arrest the nutritive activity of normal anabolism! How it must tax the recuperative powers of the surrounding parts, at the expense of the new, or permanent, teeth in their marvelously delicate processes of formation, nutrition, and growth! Think of the numerous complex abnormalities which possibly may be traced either directly or indirectly to this cause: directly, as in dental malformations and irregularities, and indirectly as in the high arch, deflected septum, and possibly hypertrophied tonsils, adenoid growths, and the many resultant and sometimes serious deteriorations of the branches of the fifth pair and their reflex influences.

When we properly understand the subtle chemistry of body metabolism, as it relates to the restoration and repair of nerve lesions, and their consequent structural defects; when we more fully comprehend the marvelous and insidious workings of cell action and reaction, as influenced by the more marvelous circulatory or fluid supply; when we begin to get intelligent glimmerings of the true or inmost nature of the various stimuli; or, to be brief, when we can treat diseases by the same means, or means of the same character as those which produced them,—then we may truly call ourselves physicians and dentists. The past history of

both medicine and dentistry shows much that is noble, progressive, humanitarian, and undeniably true; but alas, after all is said, how little we really know about the real workings of animal physiology and, as dentists, how little about the real nature of dentition!

In view of these facts and surmises, is not the proper care of and attention to the children's teeth one of the most important problems before the dental profession to-day, with a view to the ultimate improvement of the race?

Discussion.

Dr. E. S. ROSENBLUTH, Bridgeport. The essayist is certainly entitled to a great deal of credit for the able manner in which he has presented the subject, and I must say that it is a very difficult one for me to intelligently discuss. The thought occurred to me, however, that we have certain advantages in dentistry in the treatment of nerve lesions which are exceptional, and that is, that in working within the tooth, if we are unable to subdue the trouble we can remove the pulp. One of the disadvantages appears to be that if we desire to preserve the life of a pulp, it is usually found impossible; this is probably accounted for by the hard condition of the structure which incloses the pulp and renders it unable to find any relief in case of inflammation; this causes expansion of the pulp and consequently the blood supply is cut off and the pulp dies in spite of all our efforts to save it. Within the tooth we have no collateral circulation to help maintain life. Outside the tooth we may cut several nerves in cases of nerve lesions and still find that the parts will return to life with proper blood supply.

The ruthless extraction of the deciduous teeth, while no longer common, cannot be too strongly condemned. With the means now at our command the teeth of children can be cared for properly by the exercise of patience and kindness for the little ones.

Dr. JOHN I. HART, New York. Assuredly, as the essayist has indicated in a very able manner, many of the reflex

neuroses and direct irritations are caused by want of proper attention to both the temporary and permanent teeth. I think that the work that has been done by your fellow townsman, as well as that suggested by Dr. Smith of Philadelphia, has assisted us in correcting the ravages due to want of proper attention to the teeth. Surely we, as dentists, can mitigate by proper prophylaxis the ravages of bacteria as well as the irritations about the teeth which produce so much intestinal and gastric indigestion; and as we care for and assist our patients in caring for the buccal cavity, so will we be rewarded in the growth and development of the individual. We have seen the marked amount of good which has been made possible where the nose and throat men have removed adenoids, and in a few weeks the patients have gained many pounds owing to proper oxidation. Now, if we can assist in keeping the oral tract clear, so that the tissues and secretions around the teeth are healthy and the teeth do not collect around them the débris which improperly kept mouths are bound to retain, I am sure that many of the disorders which we have had our attention called to will disappear.

Dr. METCALF (closing the discussion). I would like to say a few words in regard to the dentist co-operating with the physician regarding this matter of the preservation of the deciduous teeth. I know that probably there are many present who are familiar with the fact that physicians give the teeth very little attention. I recall a chat with a very intelligent physician, a rhinological specialist, who seemed somewhat surprised when I suggested that probably the premature extraction of the deciduous teeth must affect the normal eruption of the second set; and I must admit that I was surprised myself to think that such a man, who constantly treated the surrounding parts, should be ignorant of the fact that such extractions tended to contract the arch, thereby interfering with metabolism and the incident eruption of the second teeth. I am very glad to have this occasion to emphasize publicly the unfortunate fact that physi-

cians seem to be so thoroughly ignorant of the necessity for the preservation of the deciduous teeth. It seems to be the duty of the dentist to co-operate with the physician in advising parents regarding the importance of the care of the deciduous teeth.

A motion to adjourn was then carried.

WEDNESDAY—*Morning Session.*

The meeting was called to order at 10 o'clock by the president.

The following applications for membership were read: Dr. John Jarvis Haskell, Hartford; Dr. John Louis Sullivan, Willimantic; Dr. W. E. Boucher, Hartford.

On motion the secretary cast one ballot for the three applicants, and the president declared them duly elected members.

The president then extended an invitation to all present to visit the Central Presbyterian Church and see the memorial window that had recently been dedicated to Dr. Horace Wells.

Dr. F. D. WEISSE of New York then read a paper on "Epulis." (See page 711 of present issue of the COSMOS.)

Discussion.

The president called on Dr. Broomell to discuss the paper.

Dr. BROOMELL. I have nothing to say on the practical bearing of the paper. I will make a few remarks later regarding the histological and anatomical points referred to by the essayist. I would suggest that the practical bearings of the paper be discussed first.

Dr. C. W. STRANG, Bridgeport. I think perhaps most of you are familiar with some of the cases of tumor with which it has been my fortune to come in contact and to treat. Fortunately for myself I have had but one case where the results were fatal. I have had to do with quite a number of tumors of various kinds, and in all cases, with the exception of the one referred to, the results have been satisfactory, and a cure effected. In some of these cases it has not been clear to my mind just what

conditions were present. There occurs to me at present a case that came under my care, I think, about fifteen years ago, a young woman of, I should say, about thirty years of age, presented for examination with a tumor involving canine and lateral and central incisors on the right side—a growth that had been in progress about sixteen years, and protruded below the lip so far that it was almost impossible to close the lip over it. I examined the case, and after getting the history I concluded it advisable to remove it. The growth seemed to be anterior to the canine, and I decided it would not be necessary to remove this tooth. Before removing the tumor I took an impression of the mouth, and after carving the tumor off the model I had a rubber plate made to fit the case nicely. When the plate was ready, I injected cocain freely in the tissues. That was in the early days of cocain, and I used it a little more freely than I care to use it now; however, there were no bad effects from the drug and the operation was painless. I cut down through the soft tissues with a lancet; when the soft tissues were divided, I went down into the bone-substance to the apex of the central and lateral incisors, and removed the bone and teeth in one piece. After the operation there was considerable hemorrhage, which was easily controlled, and the place was washed and packed with cotton saturated with phénol sodique. It was treated with phénol for a few days, and a healthy granulation appeared and in just six weeks the wound was perfectly healed. I never saw the case again, but it was in the hands of a brother practitioner who a few months ago had occasion to do some work in that mouth, and he informed me that there had never been any recurrence. I suppose that was a tumor of the epulitic nature that Dr. Weisse has spoken of.

Four years ago another case of the same nature came under my notice. This was a case in which the growth occurred between the upper central incisors. It had separated the incisors nearly the width of one of the centrals. The soft parts were removed;

then, fearing that the bone might be involved, a generous portion of that was also removed, including the periosteum, and the wound healed with no serious delay. I saw the case about a year after the operation, and the centrals had approached each other and assumed their normal positions and the soft parts were perfectly healthy.

Dr. G. A. MAXFIELD, Holyoke, Mass. I want to express my appreciation of the paper, and to ask the doctor one or two questions. I do not recall at present a single case of tumor such as the essayist spoke of coming under my care. I have had three cases of tumors that proved fatal, two of which after microscopical examination were pronounced carcinoma; in the third case there was no microscopical examination made. Another case that came under my observation was a tumor that I clipped off by simply tying it with a string. I find that these cases do not occur very frequently, yet they occasionally occur, and it is well for us that we are able to recognize them and put their treatment in the proper hands. I recall one case in which, if the dentist had recognized the nature of the trouble and sent the patient to a surgeon for treatment, instead of attempting to treat it himself, even if failing of a permanent cure, the patient's life might have been preserved for several years.

On one of the casts now being passed around, the tumor is represented on the right side of the hard palate opposite the bicuspid. I would like to know the treatment of such a case and how to differentiate it in diagnosis from that of an alveolar abscess. A case very similar to this came into my hands a few weeks ago. Another dentist had been treating the roots of the right central and lateral, and when the swelling appeared on the palate he told the patient she would have to go to Boston to have an operation for it. Then she was advised to consult me. After an examination and obtaining the history of the case, I told her I did not think it necessary to go to Boston for treatment. I opened into the tumor; there was a discharge of pus and it bled profusely.

I was not able to find a fistulous tract running to the lateral, though I felt sure the pus must have come from that tooth. I then made another incision just in front of the tumor and drilled through to the apex of the root; then washed it out thoroughly up through the canal and out through the incision on the palate; also washed out the tumor, using peroxid, followed with eucalyptol and aristol. I saw the patient two weeks later, when the tumor was almost gone. A week ago, when I filled the canal, the tumor had almost disappeared. Dr. Weisse alluded to his method of drilling into a tooth to determine whether the pulp is alive or not, and said that some may have another way of determining it. I agree with him that drilling into the tooth is the only way we can confirm our diagnosis.

In regard to using the zinc acetate, I would like to ask the doctor what remedy will control its action on the soft tissues if some should accidentally get on to other parts than where we wished to apply it. I remember speaking in a meeting once on the treatment of pyorrhea and advocating the use of trichloroacetic acid. A friend wrote me afterward asking what I used to control it, as he had used it with rather disastrous results, so I think it well for us to know the professor's remedy for controlling the zinc acetate. I would also like to ask what is the treatment of the tumors that appear on both sides of the alveolus as illustrated by some of his casts.

Dr. F. T. MURLESS, JR., Windsor Locks. When I was a student in the New York College of Dentistry I had a case of epulis under my care which Dr. Weisse treated. The epulis, which was quite large and had a distinct pedicle, projected buccally from the bifurcation of the roots of the lower right first molar. The tumor was removed by the use of ligatures, the tooth extracted, and an application of chromic acid made to the wound. In the course of a month or six weeks the growth recurred as a pedunculated mass, and the patient returned for treatment. The growth was again ligated and the wound treated with

chromic acid. Models were made in plaster at the different stages and preserved for reference. The history of the case is that during the eight additional years of the patient's life it did not recur after the second treatment.

Dr. GILBERT M. GRISWOLD, Hartford. I would like to inquire if epulis is always the result of some irritating substance like a pulpless root, the jagged edge of a cavity, a protruding band, or filling?

I had a patient about twenty years of age who had a growth which developed very rapidly. It seemed to start from a point in the alveolar process, between the upper right central and lateral incisors, a little below the apices of the roots, the whole growth being entirely above the gingival margin. The growth when first operated upon was of a smooth, purplish appearance about the size of the end of the little finger, extending below the incisors. The teeth were found to be perfectly normal in all respects.

Two of our most prominent surgeons were consulted with regard to the character of the growth, but without any satisfactory explanation. The growth was removed and all softened alveolar process thoroughly cut away, but it soon reappeared. It was again removed and treated and has not since appeared. After two years the parts are in normal condition, only a slight depression being left where the operation was performed.

Dr. I. N. BROOMELL, Philadelphia, Pa. Dr. Weisse has referred a question to me in regard to the presence of a periosteum on the outside lingual or buccal surfaces of the alveolus. Considering the fact that the maxillary bones are peculiarly developed we might incline to believe that there is some difference in their structure as compared to other bones. I speak with special reference to the mandible. The alveolar portion of the bone is only temporary in character so far as that it is absorbed when the teeth are lost, but it is permanent in character so long as it has a function to perform. That function is the support of the teeth; while this continues, the alveolar plates are just as permanent as any other portion of the

bone. I think I may speak from experience gained by dissections, both microscopic and macroscopic. In the early development of these parts I find the primitive periosteal cells over the growing dental follicles as well as over the exposed surfaces of the bone. Of course this early period does not include the alveolar portion, but I am led to believe that as growth proceeds, as the walls are built up, this same layer of primitive cells will be found over the bone-surface. I believe also that a certain portion of the alveolus is the result of bone-cell activity in the alveolo-dental membrane. When we consider the physiologic absorption which necessarily takes place after the extraction of the teeth, I think we can argue for the presence of a periosteum on the outside of the bone. In showing the sections last night, you may recall that I said it was necessary in making them to cut entirely through the periosteum along the base of the bone. As the dissection proceeds there is no line of demarkation to show that the periosteum is limited. It goes not only to the mylohyoid ridge which marks the extent of the true bone, but advances beyond this. As we approach the margin of the alveolus we find that the periosteum dips down into the sockets. The fibers of this tissue are associated with and enter into the construction of the dental ligament connected with the tooth at this point. These specialized fibers are present for the purpose of righting the tooth when forced or slightly rotated out of position by other than the usual masticatory forces. Speaking in regard to the general subject, I would like to ask Dr. Weisse if he has ever used the electric cautery in attempting to remove tumors such as were described in the paper. I have in a number of instances used this instrument in treating hypertrophied tissue, not where actual tumors existed but where the gum was engorged, and I find it particularly useful in treating hypertrophied gums over the third molar teeth where they are inflamed and irritated from mastication. One gentleman spoke of the use of chromic acid as applied to these cases of tumor. My under-

standing has always been that chromic acid is one of the best preservers of organic tissue known, and I do not see how it could be used to advantage in this connection.

Dr. WEISSE, New York. I am very much gratified at the discussion elicited by my paper on epulis. Dr. Strang's first case was very much like Liston's case that I showed on the screen, in which the tumor protruded between the lips. I am inclined to think that Dr. Strang's case was a fibroma, and doubtless would have assumed the proportions of Liston's case had it not been arrested by the radical operation performed by Dr. Strang, which brought about such satisfactory results. I do not remember that the doctor stated how long it had been growing.

Dr. STRANG. The case, as well as I remember it, had been growing for about sixteen years, the last two years of which it had grown very rapidly; during the earlier years I would judge it had progressed very slowly.

Dr. WEISSE. Had it ever been removed?

Dr. STRANG. Never.

Dr. WEISSE. I have never had a fibromatous epulis with such a long period of growth. I have had them covering a period of ten years. With reference to Dr. Maxfield's remarks about the importance of diagnosing these cases so as to give them proper treatment, and not confusing them with carcinoma, I would say that the progress of carcinoma of the gum enables us to positively differentiate it from epulis. The epitheliomatous form of carcinoma, when it involves the gum, is a rapid grower—with a history of months, not years—invades more and more gum area, loosens and sheds the teeth, ulcerates early, and induces secondary involvement of submaxillary lymphatic glands, manifested by their perceptible enlargement and hardness. The instance that Dr. Maxfield gave, where an alveolar abscess was diagnosed as a tumor, is not without precedent.

Dr. Maxfield asked the question what agent I used to control excessive action of the zinc acetate on the surrounding mu-

cous membrane of the mouth. From my experience none is needed, as it does not irritate the mucous membrane unduly. Dr. Maxfield also spoke of his use of the ligature for small tumors. I formerly used the ligature, but I found that it was a prolonged annoyance to the patient, and afforded only temporary relief, as the growth always recurred.

As to the presence of periosteum upon the free surfaces of the alveolar processes, I am very glad to hear Prof. Broomell's views. My deductions are from the life-history of the alveolar process, and from pathological conditions in which we see no attempt of nature to perpetuate or to reproduce the process when the alveolo-dental membrane has been destroyed. I have failed to find anything in our histological literature bearing on the question. I think it would be well for histologists to take up this subject and determine for us the presence or absence of periosteum on the free surfaces of the alveolar processes.

Dr. BROOMELL. Dr. Weisse speaks of the fact that we never have the re-forming of the alveolus after the extraction of teeth or in cases of pyorrhea. I think it is generally recognized that pyorrhea is not only a disease of the bone, but is also a disease of the surrounding parts. We have as a result of that disease the gradual disintegration of the periosteum, and for that reason could have no regeneration of bone tissue. With the loss of the teeth, that portion of the alveolus loses its functions, and there is no necessity for repair of the tissue at that portion.

Dr. WEISSE (closing the discussion). I appreciate and accept the points made by Professor Broomell in reference to the question of pyorrhea. I regard pyorrhea as primarily a necrosis of the alveolo-dental membrane progressing from the gingival margin into the alveolus, which secondarily determines necrosis of the osseous wall of the alveolus, thus depriving the tooth of its support. Here we have an instance of the primary importance of the alveolo-dental membrane to the life of the alveolar process, as compared with the inefficiency of the tissue on the free surface of the alveolar pro-

cess to perpetuate the process. Professor Broomell says: "After the loss of the teeth, that portion of the alveolus loses its function and there is no necessity for the repair of the tissue at that portion." Holding, as I do, that the alveolar process is developed and perpetuated by the alveolo-dental membrane, I would add that the extraction of the tooth destroys the alveolo-dental membrane, and therefore the process is subsequently absorbed. The vessels of the gum tissue which remain upon the free surface of the alveolar process nourish the process sufficiently to prevent its necrosis, but are incapable of perpetuating the life of the process, as no periosteum exists upon the free face of the process, the gum tissue alone being attached to it.

Dr. E. A. BOGUE, New York city, then read a paper on "The Principal Molar in Man, and its Relations to and Bearings upon the Other Teeth." (Printed in full in the August issue of the COSMOS at page 605.)

Discussion.

Dr. A. C. FONES, Bridgeport. I would like to ask the doctor, in the handling of these cases where the first molar is coming through in a wrong position, is there not some simple appliance that is especially adaptable for such work?

Dr. BOGUE. I do not want to enter upon a discussion of appliances, but I will try to answer this question. I think there is a simple appliance that is adapted to the correction of these cases. Last October Dr. Angle of St. Louis read a paper in New York describing his appliance, which I think is good for this work. Except for the scraping of the tissues on the inside of the rings and against the tongue, I think this appliance will do the work. I found that Dr. Angle had gone along the same lines as myself in this work, and the results in the main agree. What I told you about the early discovery of irregularity and the early treatment has not been published before anywhere.

Dr. JAMES McMANUS, Hartford. I want to thank Dr. Bogue, and I think those present will agree with me when I

say this has been an exhibition of some of the most remarkable and beautiful cases of this kind we have ever seen. I think Dr. Bogue deserves much praise for the great amount of labor and the years he has spent in the collection of these cases, and I can only say that many who will come after us will have more abundant means and opportunities to study these questions than we older practitioners have had. I think this a good opportunity for every practitioner to take impressions of the cases and study them, and preserve them for comparison with impressions taken later to show the results. I think this has been one of the most interesting exhibitions of this kind that I have seen, and I want to thank the doctor for myself and for the others. I make this as a motion.

The motion was carried.

Dr. McMANUS. I want also to thank the other gentlemen who have so kindly come here and given us exhibitions, and who have read us valuable papers. I make this as a motion also.

The motion was carried.

Dr. JOHN I. HART, New York. Your essayist has worked out this subject in a very instructive manner, but I think some of his conclusions are open to discussion. Dr. Bogue says that certain things should *never* be done, yet there are certain men, a little more conservative than he, who say that they *sometimes* should be done. It is unfortunately the case that some who have said that it should sometimes be done, after careful study and diagnosis, are quoted as saying that it should always be done. Nothing is farther from my mind than to assert that teeth should always or even frequently be extracted, but I assert that there are cases in which it is advisable. I was present at the meeting when the remarks were made that were quoted by Dr. Bogue, and I do not think that the gentleman intended to give the impression that Dr. Bogue implied. Dr. Bogue is too astute a man not to bring out all the points on his side of an argument, and I give him credit for presenting in a very creditable manner all these points, but we do sometimes meet with individ-

uals who are shown by their family history to be prone to caries. Then Dr. Bogue's argument does not hold, and I contend that these teeth are benefited by judicious extraction—judicious with a capital J!

Dr. Bogue says that if Adelina Patti had had her permanent molars extracted before her twelfth year she would not have had the voice she has. He admits that there is a time when it can be done to better advantage than later. He admits that there is a time to extract them, and I say it is best to extract them before the second molars have come properly into the arch and have become properly cusped.

Dr. BOGUE (closing the discussion). It seems to me that there is something in the human heart—an acquired something—which seems like perversity; I do not know what else to call it. At the meeting to which Dr. Hart refers there was a paper read which elicited considerable discussion, but there was apparently a perverse disposition upon the part of all the gentlemen present, except two or three, to misunderstand what I said. I spoke of scientific facts without regard to cost, time, or class of patients. Dr. Hart says that the more conservative men take a different view from mine. I wish to make a correction there. I am the conservative fellow; those who do not conserve, extract. I have never said in my life, *Never* extract. When it is necessary, I *do* extract. I have extracted five teeth during the last twenty years—I mean good permanent teeth. Three were impacted third molars. One was an upper lateral incisor of a young lady thirty years of age who had been to four or five different men to have the tooth regulated, but none were successful. In that case I thought extraction was desirable, and so extracted the tooth. The last was an upper third molar having no antagonist that prevented me from saving a second molar that was useful.

Now, what I have undertaken to show this morning is the manner in which, or the age at which the teeth develop, and their place when they have developed. I have attempted to persuade my brother

professional associates to look upon this as I have been forced to look upon it, and to avoid the mistakes from which I have had to suffer. If they will look into it they will reach conclusions such as I have. I will say to Dr. Hart, that if he will make models and study them as I have done, he will learn some things that he did not know before.

One thing more: If we will look more carefully on the little children who come into our offices, and take impressions of their mouths and study them carefully, and study the conditions, we can tell why the teeth are going to become regular or irregular, and we will learn a great many things that we have heretofore known nothing about.

On motion the subject was passed, and the reports of the different committees were next taken up.

Dr. D. W. JOHNSTON, New Haven, remarked in regard to the place of meeting for the ensuing year, that he thought it for the best interests of the association that they meet in Hartford for the fortieth anniversary, and have a Hartford man for president.

Dr. STRANG. As chairman of the Committee on the President's Address, I beg to report that the committee has examined the address and considered the suggestions made therein, and express the wish that the president's address be published, and the recommendations made in the address will receive attention at a later date.

On motion the report was accepted.

Dr. A. C. FONES then read the report of the Committee on Necrology as follows:

REPORT OF COMMITTEE ON NECROLOGY.

The Committee on Necrology beg to report that during the past year but one death has

occurred in our membership, that of Dr. George H. Waters of Waterbury.

Born nearly eighty years ago, in 1824, at Thompson, Conn., George H. Waters received his early education in the common schools at Thompson, and also at the Dudley Academy of Dudley, Mass. In 1849 he took up the study of dentistry under the worthy preceptorship of Dr. Joseph H. Beals of Greenfield, Mass. He came to Waterbury in 1852 and remained there in active practice up to the time of his death, which occurred February 1903. During his earlier life he was active and prominent in athletics. For forty-eight years he was a prominent Odd Fellow, and published in 1898 some historical notes concerning Nosa-hogan Lodge, No. 21, of Waterbury.

Being one of the original members of this association in 1864, he can well be classed with that faithful body of men who have laid such a good foundation for our profession in this state. A skilful and conscientious workman, he gained the respect and esteem of the community. We may remember him as one whose life was well spent and a man whom our profession may well honor.

A. C. FONES,
HOWARD G. PROVOST,
GEORGE S. KENDALL,
Committee.

On motion the report was accepted.

The Committee on By-laws offered as a suggestion for the consideration of the incoming president and to be acted upon at the next annual meeting, that a "Program Committee" be appointed whose duty should be to arrange the papers for the annual meeting.

The Nominating Committee having made their report, which was unanimously accepted,

The new president, Dr. Geo. O. McLean of Hartford, was conducted to the chair, and after the passing of various votes of thanks,

Motion was made and carried to adjourn until next year.

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PHILADELPHIA, SEPTEMBER 1903.

EDITORIAL DEPARTMENT.

THE FOURTH INTERNATIONAL DENTAL CONGRESS.

At the Niagara Falls meeting of the National Dental Association, 1902, the expediency of holding an international dental congress during the period of the St. Louis Universal Exposition in 1904 was broached and discussed, with the result that a resolution was formally passed authorizing the holding of such a congress under the auspices of the National Dental Association with the support and patronage of the Directory of Congresses of the Exposition. To carry into effect the purpose of the enacting resolution an executive committee of fifteen members was appointed and vested with plenary powers to organize the congress and bring it to successful issue. The "Fédération Dentaire Internationale," created at the last session of the Third International Congress in Paris in 1900 by authority of the delegates there assembled, had relegated to its *ad interim* committee—the Executive Council of the Federation—the right to designate the time and place for holding the next International Dental Congress, and the National Dental Association, recognizing the courtesy due to the F. D. I. in the premises, addressed an invitation to the "committee of the Federation having in charge the promotion of the Fourth International Dental Congress" to designate St. Louis, Mo., U.S.A., as the place, and August 1904 as the time, for holding the said congress. The invitation was duly accepted and the time and place designated in accordance with the terms in which the request was presented. Owing to a regrettable difference of opinion as to the powers of the Federation in connection with the work of organization, a considerable delay in carrying

out the details thereof unfortunately occurred. These differences have, however, been happily adjusted and the preliminary work is now practically completed.

The date of the Fourth International Dental Congress has been officially fixed for the week included between August 29 and September 3, 1904. The plan of organization—comprising the arrangement of sections, the several committees dealing with the work in all of its ramifications, covering the scientific, historical, literary, and material development of dentistry, as well as the financial and social aspects of the congress—has been provided for, and the machinery of organization is now in active operation. Representative men of known ability have enlisted their energies in the work, and so far as it is within the compass of the dental profession of America to make the congress a grand success it will be done.

In undertaking this work the Committee of Organization is imbued with the sentiment that the dental profession of America is to be the host in a professional reception at which the world of dentistry is its invited guest. It is in a broad spirit of generous hospitality that the National Dental Association of America invites its sister organizations of all nations to join in this great effort of demonstrating to the world at large the advances which our profession has made, and its claims to a high position among the arts and sciences which minister to the health, comfort, and happiness of humanity.

We already have assurance that the general interest in the success of this movement among other nations is sufficient to establish its cosmopolitan character and to make it in fact, as well as in name, an international congress.

We publish elsewhere in this issue the plan of organization in detail, as far as at present perfected, with the exception of the names of those constituting the several committees, the personnel of which is not yet quite completed. All who have accepted the responsibility of sharing in the work of organization have entered upon their duties with enthusiasm and an avowed determination to do their utmost to make the Fourth International Dental Congress the greatest meeting of its kind in the history of dentistry.

In August 1904 the profession of dentistry will have rounded out sixty-five years of what may be regarded as its corporate existence, if we may regard the year 1839—when the first national association, the first dental college, and the first dental journal were created—as the natal year of organized professional dentistry. An endeavor will be made to bring into visible comparison the status of dentistry then and as it will be at the time of the congress, and to demonstrate the steps by which its present development has been attained. The intervening time between now and the date of the congress is less in some respects than it should be to accomplish all that must be done in order to realize the ideal which the

Committee of Organization will attempt on behalf of the profession which it represents. But what is lacking in time must be made up in active enthusiastic endeavor, and to that end the earnest co-operation of all reputable dental practitioners throughout the world is cordially solicited. Contributions to the literary and scientific features of the congress are desired. Clinical demonstrations, exhibits of appliances and instruments, of historical material, and of any and all objects or features having a technical, historical, or educational value, with suggestions or expressions of opinion helpful to the purposes of organization or in bringing the work to a successful issue, will be thankfully received by the committee.

It is hoped that every member of the dental profession in America will regard this movement not only as one in which he has a personal interest, but as one which involves also a personal obligation to co-operate cordially and harmoniously toward its success. Let each of us, then, realize that he is charged with his share of the duty of maintaining the credit of the profession of which he is a member, by contributing of his ability, means, and time toward this great meeting; and further, of demonstrating to those who will be our guests from foreign countries, that the hospitality of America is a fact, not a theory. We have undertaken and accomplished great things in the past; let us do better than ever at St. Louis in 1904. All that is needed is active work and harmonious co-operation to make the record of the Fourth International Dental Congress one in which shall be written more of permanent good for dentistry than has ever been previously attained.

BIBLIOGRAPHICAL.

THE HISTOLOGY AND PATHO-HISTOLOGY OF THE TEETH AND ASSOCIATED PARTS. By ARTHUR HOPEWELL-SMITH, L.R.C.P., M.R.C.S., L.D.S., Lecturer on Dental Anatomy and Physiology, Assistant Dental Surgeon, and Demonstrator of Practical Dental Histology at the Royal Dental Hospital of London, etc. With 2 Colored Plates and 493 Illustrations in the text, including 300 Original Photomicrographs by the Author. Pp. 624 and Index. London: The Dental Manufacturing Co., Ltd. 1903.

This valuable contribution to the literature of the minute anatomy of the

teeth and associated tissues, normal and pathologic, is presented under three divisions: Part I—The Histology of the Teeth and Associated Parts. Part II—The Histogenesis of the Teeth of Mammals, Fishes, and Reptiles. Part III—The Patho-histology of the Teeth and Associated Parts.

Perhaps no department of dental research has attracted more able minds or a larger number of investigators than that included within the scope of the work under consideration. Most of the earlier anatomists gave no little attention to the minute structure of the dental organs, and from the time of Antoni Leeu-

wenhook until the present the subject has been a fruitful field of investigation, yielding results increasingly valuable as the development of the microscope and histological technique have correspondingly improved. The mass of literature upon the subject is enormous, and the multiplicity of recorded observations has rendered exceedingly difficult the task of collating and systematizing all that is of value in connection therewith. Errors of observation, with the consequent faulty deductions therefrom, have further intensified the difficulty of bringing into consecutive order and logical arrangement the ascertained truths which go to form this department of anatomical science.

It is this difficult task which the author of the present work has undertaken, and of which he has most creditably and satisfactorily acquitted himself. The treatment is judicial throughout; the results of his own work as an investigator are weighed in the balance with that of all others deemed worthy of consideration, and each without prejudice or favor is standardized by the measure of its contained truth.

The arrangement of the matter and the development of the subject is logical and systematic; the language is clear and entirely free from verbiage. It is a book not for beginners, but for the advanced student who desires to obtain a thorough scientific knowledge of the subject. For that class of readers, and as a treatise and compendious book of reference, we have not seen its equal.

We would especially call attention to the splendid adaptation of the wealth of illustration to the elucidation of the text. Too often the reverse is the case, the text being little more than explanatory of illustrations introduced for display and not for teaching value. While advocates of special theories or of personal views will undoubtedly find statements in the work which they may be inclined to question, we feel sure that the author has given to the dental profession the best work upon dental histology as a whole which has yet been published.

The technical excellence of the work as a specimen of book-making—its presswork, typography, illustrations, paper, etc.—is of a high order and fully in keeping with its contents.

REVIEW OF CURRENT DENTAL LITERATURE.

[*Dental Summary*, June 1903.]

INFECTION. BY ELGIN MAWHINNEY, D.D.S.,
CHICAGO, ILL.

To infect means to introduce into the tissues a poison or virus which has the power of invading and multiplying, thereby setting up disturbances of physical well-being. This disturbance may be local only, or it may affect the whole organism as well. Indeed, it is certain, if the local infection is violent, that the system as a whole will suffer.

The author is of the opinion that the profession generally does not appreciate the im-

portance of the foregoing view as fully as its bearing upon dental practice warrants, for while it is true that most dentists have learned to recognize syphilitic cases and are fully aware of the danger of infecting themselves and others therefrom, he believes that a majority of dentists regard that disease as the only source of danger, and he draws attention to some of the most common ways in which we may infect pulps, gums, or other tissues of the mouth, and suggests a method to avoid doing so. Infection depends upon certain things, among which are—(1) The nature and condition of germs infecting with

reference to virulence. (2) The condition of the part through which infection occurs with reference to location, to the cellular elements of the tissue, as well as to its chemistry. (3) The condition of the system as a whole with reference to nutrition, including assimilation, excretion, and metabolism. When the normal physiological functions are disturbed infection takes place more readily. The mouth is usually a hotbed of micro-organic life. The saliva is normally antiseptic to a slight degree, and is constantly moving. Were it not for these facts, we would have more difficulty in getting open wounds in the mouth to heal. When tissue becomes injured, abraded, or loses its vital force, and infectious material is confined within or retained upon it for a period of time, liability to infection increases, hence the importance of thoroughly cleansing surfaces through which hypodermic needles, lancets, or exploring needles are to be introduced.

Before scaling teeth, all putrefactive material lying upon the gum margins or around the necks of the teeth must first be gotten rid of. The same precautions should be taken before placing a rubber-dam clamp around the neck of a tooth, or in the use of any instrument or procedure liable to injure the soft tissues of the gum, as in the case of wedges or separators. As a preparatory cleansing method, the author recommends the use of hydrogen dioxid applied with a ball of cotton in the pliers, and carrying a little fine powder to scrub the teeth and gums, this being followed with an antiseptic solution from a compressed-air atomizer to wash out the interproximal spaces. The mouth should be thoroughly flooded, depending as much on the mechanical cleansing as on the antiseptic character of the wash.

In operating on teeth where the pulp is involved, the additional precaution of washing off the tooth with alcohol before the rubber dam is in position, should be taken. As a germicidal solution he recommends sublimin, 1:200, and for the purpose of wiping off scalers he uses small squares of chinosol gauze. He attributes much of his success in treating pyorrhea alveolaris to the method above described. He emphasizes the necessity for broach sterilization in the treatment of canals, and reports a series of experiments made with different antiseptic agents, finding as the result that the usual methods of sterilization with essential oils, etc., are inefficient. He recommends the use of sublimin, 1:200, for the sterilization of steel instruments, and chinosol, 10 per cent., for other instruments. For the general sterilization of

instruments he recommends the use of boiling water containing a slight amount of sodium bicarbonate, in which instruments are to be boiled for fifteen minutes.

[*Texas Dental Journal*, June 1903.]

A METHOD OF BANDING LOGAN CROWNS. BY R. D. GRIFFIS, D.D.S., PARIS, TEXAS.

The author gives preference to the Logan crown, as it has the advantage over most porcelain crowns in more nearly imitating the natural teeth, and the body being molded under high pressure and baked around the post makes it a very strong crown.

The author states that while there are many methods of banding Logan crowns for the protection of frail roots, some of them are objectionable because they are lacking in esthetic quality, and others are not as strong as when banded by the method he gives. The crown which is to be described is a banded Logan with new porcelain baked in the space between the floor of the band and the crown. The technique of constructing an incisor or canine crown by this method is as follows:

After the root has been prepared as for a Richmond, and the pulp-canal enlarged for the post, a platinum cap is fitted to the root, and a hole drilled through the floor for the post of the crown. The crown is now fitted to the top. It should be ground so there is a fairly good joint on the labial surface. After the crown has been adjusted to the proper alignment with the other teeth and has normal articulation, it is removed from the cap and its post slightly warmed. Then a small amount of hard wax is placed around the post and the crown adjusted in position. After the wax has been thoroughly chilled the crown and cap are removed in proper relation; the surplus wax is removed, and the crown and cap invested for soldering the cap and post together. After soldering thoroughly, cleanse and bake in the new body. The body should be made into a thin paste and worked into the space between the floor of the cap and the crown until it is well filled. About two bakings will suffice.

This method gives the Logan a good joint that harmonizes with the crown. It has all the advantages of the untipped Richmond without its disadvantages. It has advantages over the unbanded Logan, in that the root is hermetically sealed, removing all possible chance for fracture or decay. There is no danger of the root splitting. If the diameter of the neck of the crown should be less than that of the root, it may be increased by add-

ing a sufficient amount of body to that portion of the crown. Or, if the crown should be too short, it may be lengthened by leaving a longer space between the floor of the band and the crown and filling in with body.

One place in particular where this crown may be used to good advantage is in a mouth where the teeth are quite irregular, making it almost impossible to obtain a perfect joint with an unbanded Logan. If this method of banding a Logan is used, all that is necessary is to get the crown in proper relation to the other teeth, and a good joint can be made in all cases.

[*Texas Dental Journal*, June 1903.]

FORMALDEHYD IN THE TREATMENT OF ROOT-CANALS. BY B. F. THIELEN, D.D.S., PARIS, TEXAS.

The author states that he has used this preparation in the treatment of root-canals for more than a year, and success has attended its use in every case. He advocates the use of a forty per cent. solution in all cases of immediate extirpation of pulp after the canals have been thoroughly cleansed. Following the application of formaldehyd solution, the canals are dried and immediately filled. Where a pulp has died and become putrescent it is removed, the canals thoroughly cleansed with an application of ammonia water followed by warm water, then, after thoroughly drying, the formaldehyd is applied, after which the canals are sealed for twenty-four or forty-eight hours. Then, in the majority of cases, the putrescent odor has disappeared and the canals are ready for permanent filling. The author states that while some who have written on this subject recommend that the drug be used in milder solution, he has always used the forty per cent. solution, and in no case has there appeared any untoward effect.

[While we have not the slightest doubt that formaldehyd in forty per cent. solution may be safely used in the treatment of root-canals, as indicated by the author of the above communication, nevertheless great caution must be exercised both as to the quantity of solution used and as to the length of time during which this highly active and irritant antiseptic is permitted to act upon the pericementum through the apical foramen. It is not the strength of solution which is involved so much as it is the quantity of the drug and the duration of its action which qualifies the safe use of formaldehyd in these cases. The mere wiping-out of the canal with forty per cent. formaldehyd solution and the

subsequent vaporizing of the drug by warm air, and afterward filling the canal permanently, may be done with reasonable assurance of safety, but experience has shown, and cases are on record in support of the assertion, that the sealing into a canal of a dressing containing a considerable amount of concentrated formalin solution may act not only as an apical irritant, but cause extensive necrosis and sloughing of the tissues in the apical region. Therefore, if concentrated formalin solutions are to be used in canal treatment as an accepted mode of practice, it must be done with due recognition of the possible dangers which are almost sure to result from the use of an excessive amount of this potent drug.—ED. COSMOS.]

[*Dental Summary*, August 1903.]

THE RELATIVE AND COMPARATIVE MERITS OF SURGERY AND PROSTHESIS IN THE CORRECTION OF HARE-LIP AND CLEFT PALATE. BY G. V. I. BROWN, M.D., D.D.S., MILWAUKEE, WIS.

The author presents for consideration two propositions: First—Why has the use of obturators been necessary heretofore, and what have been shown to be their objectionable features? Second—Is it possible, by modern surgical methods, to do away entirely with mechanical devices of any kind for covering the fissures in cleft palates in all cases, and can as good, or better, speech results be secured with natural as with artificial vela?

Obturators have been required as being the only relief possible for patients whose cases were beyond the reach of surgical skill, according to old methods. Therefore, any benefit thus conferred was a great one, and even a slight improvement in speech was not to be lightly estimated, but as a boon beyond price to the individual.

After discussing the objectionable features of artificial vela and obturators, the author claims for the system which it has been the chief object of his life to perfect, that every form of cleft palate can be closed by operation.

Generally speaking, it has hitherto been understood that certain forms and conditions of cleft palate could be cured by operation, while for others operative methods were comparatively useless; for example, in early infancy, from birth to the third month, or where the fissure was not too wide and the sides of the palate favorably shaped, operation was indicated. With adults or older patients having unfavorable clefts and palates, a prosthetic

appliance is likely to prove more useful. By a systematic application of orthopedic principles all forms and conditions of these deformities are brought to a nearly common plane, through the readjustment and correction of unfavorable conditions with due recognition of those differences which distinguish simple from difficult or impossible cases.

In favor of operation in early infancy, it may be said that the jaws, not being fully ossified, are in a sufficiently plastic state to allow their being easily crushed together, and the separation closed immediately by operative measures; also that the later widening of the cleft, which follows if cases are neglected, does not occur. The child takes nourishment to better advantage. Speech habit is assured, since with the covering to the palate from the beginning, little or no opportunity is given for the establishment of imperfect speech.

The objections are—First, high rate of mortality among infants under surgical operation of any kind. Second, in such cases the added danger of meningitis from infection or pressure, or both. Third, loss of vitality from hemorrhage and other direct effects of operative procedures, in spite of the admitted fact that shock in the common acceptance of the term may not be so serious a factor in infancy as in later life. Fourth, disturbance of the digestive tract and consequent loss of nourishment, due to mouth bacteria and to difficulty in taking food incident to the sutures and plates to which the parts are secured. Fifth (based upon the experience of the writer), the characteristic appearance of the face, nose, and lip, resulting from arrest of development following radical operation in early infancy is not so good, nor is the soft palate usually obtained—in the haste that with the newly born is imperative—likely to be so perfect or afterward so useful, as one treated under conditions where more deliberate methods are possible.

In order that increase of deformity by neglect may not occur, it must be remembered that at birth the lower jaw has undergone ossification much in advance of the condition of the maxilla and bones of the nose and face. Therefore the crowding of this wedge-shaped harder body between the soft, yielding, and ununited lateral portions of the palate, due to the force exerted by the muscles of mastication in efforts to suck and in taking food, must press them farther up. In crying and laughing, also, the muscles of the mouth and cheeks pull apart and in a marked degree tend to the widening of the intervening space. Therefore, if early operation be considered an

unnecessary danger, the first essential step must be to protect the child from greater distortion, and if possible, reduce the deformity. The author's method of wiring to correct this feature and to simplify the lip operation by reducing the width of the lip and palate fissures, and in addition to secure a straight nose for the individual with regular facial appearance, has already been described in a previous paper before the American Medical Association, but he has been able to simplify this method where the infant can be placed under treatment sufficiently early. With strips and bandages properly applied the lip may be bound with the sides of the fissure in contact, thus aiding its development and preparing for the success of a future operation. The action of the lower jaw cannot, under these conditions, crowd the parts and increase the palate deformity, while laughing or crying exerts muscular power to reduce the separation instead of widening it, stretching the lip so that usually there is an abundance of tissue where otherwise it might be so scant as to make artificial results extremely doubtful. If the palatal fissure be too wide and the lateral surfaces of the palate be too flat to admit of a successful operation for immediate closure, the space to be bridged across the fissure must be made narrower, and the angles of the side more accentuated in their slope, in order that, when stripped away from the borders of each side, the pericementum and other tissues when brought down in the center may meet without tension by simply making the arch of the palate flatter. If the patient be in early infancy, simple harnessing of the natural muscles as previously described is sufficient. At one year old, or a little later, appliances attached to deciduous teeth, admitting of gradual pressure being exerted by nut and screw-thread will, without serious disturbance, overcome the natural difficulties almost entirely. Operation is then not only easier but safer, while speech defects have not yet had time to become established habits. In later life, either by fracture and immediate molding of the parts, with splint to hold in the desired form, or weakening of resistance by cutting the external walls of the maxillary bones partly through, especially at the malar processes and in the region of the tuberosity, an appliance similar to the one used for younger patients may be employed to accomplish very nicely the purpose of reducing to ideal form.

Whatever the method of correction may be, the immediate results as regards speech will be disappointing. Just as one finds it difficult to pronounce the words of an alien

tongue, and in attempting to do so is not conscious of the accent which proclaims to all the place of his nativity, so with the wearer of an obturator and the possessor of a new soft palate. The old defects will remain until eradicated by careful study and patient application.

[*Dominion Dental Journal*, July 1903.]

THE IMMEDIATE TREATMENT OF DEVITALIZED OR PARTLY DEVITALIZED TEETH. BY A. J. McDONAGH, L.D.S., TORONTO.

There are a number of different degrees of pulp-infection. Sometimes the pulp has become infected before the cavity, as we see it with the naked eye, has reached the pulp-chamber, in which case the author would unhesitatingly open into the pulp-chamber with the assistance of ethyl chlorid, devitalize the pulp, remove it, and fill the pulp-chamber, root, and cavity at one sitting, and without delay.

Those cases are not the rule, however; generally the cavity has reached the pulp-chamber and the infection has proceeded to a great extent, in which case it is not wise to drive cocain or chloretone into the pulp; nor in fact in any case where the infection has proceeded to such an extent that the medicine would likely drive the infection before it. If there be any doubt on that point,—and there often is,—it is wise to use either pure carbolic acid or carbolic acid and chloroform, which latter is supposed to add to the anesthetic effect and increase absorption, a supposition which from experience he very much questions. Before using any pressure, even with carbolic acid, we should remove all the disintegrated pulp tissue; first mechanically by instruments, and then chemically by the use of sodium dioxid (and here he says in

passing that sodium dioxid beats all the digesting agents that one can put into a pulp-chamber, because its work is almost instantaneous and is thorough); then, and not till then, use pressure. This for two reasons—one is to avoid inoculating healthy tissue or nearly healthy tissue with septic matter, and the other because carbolic acid or any other agent used for this purpose will act better when placed in contact with live tissue, so far at least as the anesthetic effect is concerned.

The foregoing procedure may be practiced as long as any live pulp remains to close the apical foramen or foramina, as the case may be. After the pulp has been thoroughly devitalized and incidentally disinfected by the carbolic acid, remove with drills all the affected dentin in the pulp-cavity proper and wash it out; extract the remaining portion of dead pulp as far as possible with a broach, after which exclude the moisture either by napkins or by rubber dam, preferably by napkins. Be sure that all infection and all particles of the dead pulp are removed. This is accomplished by the use of fluid sodium dioxid followed by sulfuric acid. It is not always necessary to treat with sodium dioxid and sulfuric acid, if the infection does not extend too far into the root. The extent of infection can always be inferred by observing where the pulp is found to be alive. It is not necessary to take further precautions than mechanical cleaning, provided the proper material for filling the root-canals is used. With the conditions above named and with the amount of treatment described, he believes that gutta-percha is the proper filling material to use. There are two and perhaps more materials, however, which may be advantageously used; one is zinc oxychlorid, and the other zinc phosphate and creasote.

PERISCOPE.

About Ether Anesthesia.—In giving ether it is a mistake, after anesthesia is complete, to continue it until a profound effect is produced and then to leave it off until the patient shows signs of returning consciousness. Allowing the patient one breath of pure air to every four or five of ether will commonly keep him in excellent condition, while the anesthesia is effective and safe.—*Internat. Journ. of Surgery*.

To Get Between the Teeth.—Whether for examination or cleansing purposes, waxed silk, fine linen thread, or rubber bands may be made to pass between the teeth readily by first soaping them. Cotton tape or twine is easily made to go to place for wedging purposes by first subjecting it to the same treatment. The soap soon disappears and the cotton swells as of old.—*Dental Office and Laboratory*.

To Prevent Bands for Regulating Appliances and Clasps from Changing Shape when Polishing.—Fill the bands with modeling composition, chill, and remove surplus with a sharp knife.—J. Q. BYRAM, *Dental Review*.

Imperfect Root-Fillings.—I have put all sorts of things into canals, and have come to the conclusion that the reason we have odors from pulp-canals is because they are not hermetically sealed.—J. G. REID, *Dental Review*.

What is a Bridge?—I would define a bridge as a contrivance for replacing lost teeth, a contrivance which is either fixed or removable, and which has the natural teeth for its support.—ALEX. A. MATTHEWS, *Brit. Dental Journal*.

Antiseptic Mouth-wash.—

R—Thymic acid,
Benzoic acid, āā 15 grains;
Oil of peppermint, 5 drops;
Alcohol, 3 ounces. M.

Sig.—A teaspoonful in a glass of water.

—GROSSET, *Rev. Odontologique*.

A Suggestion on Anesthesia.—It is never a good plan to anesthetize a patient in the presence of many people. It renders patients more agitated and nervous. It is preferable to anesthetize in an adjoining room, or to cause all but the anesthetist and one assistant to leave the room until the patient is thoroughly under the influence of the anesthetic.—*International Journ. of Surgery*.

How to Arrest Pain Following the Extraction of Teeth.—Fill the alveolus with a cotton tampon saturated in a solution composed of equal parts of chloral hydrate, glacial phosphoric acid, and glycerin, and the pain will disappear. The chloral hydrate and the glycerin attenuate considerably the caustic effect of the glacial phosphoric acid. This dressing, besides the pain-relieving properties it possesses, is a powerful antiseptic.—*Rev. de Dentisterie Appliquée*.

Don't Remain Within the Limits of Your Calling.—I believe, then, in being master of every situation, a Jack-of-all-trades; I believe in so combining my individual profession with chemistry, with physics, with electricity, with therapeutics, with anatomy, that if a patient comes into my office for advice, I shall be able to go outside of the narrower limits of my profession and diagnose a case approximately from every standpoint.—C. L. HUNGERFORD, *Western Dental Journal*.

Some Dangers of Hypnotics.—Hypnotics may all involve danger, and the conditions under which they may produce undesirable results are not always dependent upon the dose. The danger may be limited to the patient or may involve the prescriber or the dispenser. Before the employment of an hypnotic the bare symptom of sleeplessness is perhaps the least important factor to be considered.—NESTOR TIRARD, *Lancet*.

Removal of Foreign Bodies from the Esophagus.—For the removal of fish-bones, pins, needles, etc., from the upper part of the esophagus, if a bristle probang is not at hand, make a little ball of absorbent cotton, lubricate it with a little butter after it has been tied to a string, and cause the patient to swallow it. By pulling it out again with the string the foreign body can often be removed.—*Internat. Journ. of Surgery*.

Breaking Down Overhanging Enamel Walls.—In breaking down overhanging enamel walls, I might suggest—whether an old idea or a new one—that a cone-socket chisel used in an automatic mallet I have found to be just the proper instrument for this purpose. One can place the cutting edge of the chisel firmly against the enamel, and at the same time with the same hand get the desired stroke, which does the work and is perfectly under the control of the operator.—C. E. WATERMAN.

A Couple of Suggestions.—

To wash out wax from investments, use an ordinary water syringe instead of pouring water from a vessel. The S. S. White syringe seems best.

Shanks of old engine burs ground to the shape desired are inexpensive and excellent for trimming approximal spaces where plain teeth are used. When the manufacturers supply a nice little handle with chuck for holding the burs we need not trouble them further along this line.—S. PRESTON.

To Disguise the Odor of Creasote.—Legendre states (*Rev. Internat. de Médecine*) that he prescribes creasote in the following palatable manner: About one hundred grams of roasted ground coffee are mixed with a liter of a 6 : 1000 solution of creasoted calcium phosphate (chlorhydrophosphate de chaux creasotée) and set aside for four or five days. The resulting fluid is filtered and sweetened with two hundred grams of syrup of tolu. One tablespoonful contains 7.5 centigrams of creasote.—*Journ. Amer. Med. Association*.

Repairing Amalgam Fillings.—Clean the surface of the filling to be repaired with a cross-cut bur, leaving the polished ridges. Wipe the surface over with phosphoric acid—I use the liquid of Harvard cement; take a small piece of the soft amalgam and burnish it over the prepared surface, when it will combine at once; then build the rest of the amalgam up to the required shape. I have tried nitric and sulfuric acids. I found that with nitric acid the amalgams will not combine at all, and with sulfuric acid the joint was only a little more than half as strong as with phosphoric acid.—STANLEY READ, *Brit. Dental Journal*.

Take Models of the Mouth for Diagnostic Purposes.—When approaching a case for treatment and an examination of the mouth reveals a weird variety of roots and teeth, it is not advisable to decide and commit oneself too hurriedly upon the treatment to be followed, as it may transpire upon closer investigation that some different treatment from that which first suggests itself is necessary. To make a change often means delay and loss of time, and it looks like indecision, and is liable to disturb the confidence of the patient. I lay great stress, therefore, on obtaining models of the mouth before anything is done, taking time to consider them carefully before making any specific statement as to the treatment advocated. The models will show which teeth it is best to preserve in view of supporting the denture or bridge or for giving the best articulation.—ALEX. A. MATTHEWS, *Brit. Dental Journal*.

Experiments in Disinfection with Formaldehyd Gas.—Ravenel (*Univ. Pa. Med. Bulletin* for April 1903) reports his conclusions reached from a series of experiments designed to determine the value of this means of disinfection. He concludes that formaldehyd gas well deserves the high place which has been accorded it as a germicide. The employment of special apparatus for generation of this gas, while convenient, is not requisite for its successful application, and no one should be discouraged from using it by the lack of such appliances. The germicidal action of formaldehyd gas is largely controlled by certain factors which are as yet imperfectly understood. Other things being equal, the most important of these are moisture and temperature. Each operation must be controlled by the exposure of test cultures distributed in every portion of the room to be disinfected, and no operation is to be regarded as successful until all such cultures are

proved to have been destroyed.—*Therapeutic Gazette*.

Immunity of the Tissues of the Dental Cavity to Auto-infection.—Dr. R. H. M. Dawbarn, in discussing the paper by Dr. Samuel A. Hopkins upon the "Medical Aspects of Dental Lesions" (*International Dental Journal*, August 1903) stated as his opinion that the explanation of the well-known immunity of the tissues of the oral cavity to auto-infection lies in the fact that from birth until death the region under discussion is vaccinated, so to speak, with ptomaines and toxins, the products of the life activities and death decompositions of the germs normal and native to that region; and that because of such vaccinations, the outcome of the numerous slight lesions so frequently occurring, the flesh thereabouts is in some way made better able to combat and overcome any ill results when greater wounds are received. Then, too, it is a fact worth noting that each healthy individual's saliva is not dangerous to himself, even elsewhere than the mouth, wounds, or fractures, though this secretion would be perilous to another individual. Probably the reason for this is the one already mentioned—a continual vaccination. We have all seen wounds upon the hands of street urchins sucked and washed clean by their spittle, just as a dog cleanses himself, with no ill result.

Theocin.—Dr. Chevalier (*Rev. de Thérap.*, 1903, p. 73) has made an elaborate and complete review of the literature concerning the new synthetic alkaloid, "theocin," from the chemical, physiological, pharmaceutical, and experimental standpoint. Traube, a chemist, succeeded recently in manufacturing, in a practical and not too costly a way, synthetic theophyllin—which is so difficult to extract from the natural product, tea—and this has been introduced in its available therapeutic form under the name of "theocin," a soft, white, bitter powder. The quantity of water eliminated by a healthy subject is considerably increased after the absorption of seven and one-half grains of theocin. The quantity of mineral salts excreted is equally increased. It does not, however, seem to have any decided action on the elimination of the organic substances of the urine. Its efficacy has been established in cases where there was considerable edema. There has as yet been no proof of irritation of the kidneys from the use of this substance. In cases where there had been albumin previously, it was not increased in proportion to the increase of the diuresis, and in other cases more has been caused. The

therapeutic dose does not seem to influence the cardiac function; the frequency of the pulse and pressure of the blood are not at all modified. Its administration may be attended at first by slight stomachic difficulty, such as loss of appetite and vomiting. It also, sometimes, has an exciting effect on nervous patients. To remedy these inconveniences it may be given in an alkaline combination or with hedonal. The doses in practical use are from three to seven grains in a cup of tea three times a day after each meal. A dose of seven and one-half grains, as with caffein, should be considered a maximum.—*Amer. Journ. of the Med. Sciences.*

Successful Replacement of Four Deciduous Teeth Forced Out by Traumatism.—

The following interesting case occurred in the practice of Dr. Samuel E. Earp, of Indianapolis. He was called May 6, 1902, to see the granddaughter of Dr. A. R. White, an infant aged sixteen months, who while seated in a hobby rocker, in which she was violently rocking to and fro, caught her lower incisor teeth between the wooden tray and a cross-bar, which were attached to the front of the rocker, during a forward movement, and upon violently rocking backward the teeth were forced from their alveoli, dislodging them so that

their labial surfaces were brought into contact with the lower lip. The gum tissue on either side was lacerated to the alveolar margin of the maxillary bone. There was a slight attachment of tissue on the anterior surface, which in this position would in reality be the under surface, so that it comprised a plate with the apices of the roots completely detached and extending over the inner margin. An elevation on each side of the wound indicated that the canines were upon the verge of eruption. There were no teeth to which a mechanical appliance could be attached. The hemorrhage was no more than would result from the extraction of several teeth. The injured parts and mouth were treated with an antiseptic solution consisting mainly of boric acid, the teeth replaced, and after firm pressure for five minutes were kept in place by a pledget of cotton saturated with the same solution, but the customary head bandage was ineffectual. A combination of sodium bromid and chloral hydrate was given to produce quietude. The diet was liquid. Two days later the child fell and produced the same condition of affairs as existed at my first visit. The injury was dressed as before, and after a few weeks the teeth were firm, and at this date all are uniform and in a healthy condition.—*Pediatrics*, July 1903.

OBITUARY.

DR. JOHN EDGAR LIBBEY.

DIED, July 18, 1903, at his home, 627 College avenue, Pittsburg, Pa., of heart failure, JOHN EDGAR LIBBEY, D.D.S.

Although Dr. Libbey had been complaining of ill health for some time past, he was not thought to be in any immediate danger. He had been attending to his practice regularly and was at his office the day previous to his death, which came suddenly, probably from heart failure due to general breakdown. His sudden and untimely decease comes as a great shock to a wide and devoted circle of friends.

Dr. Libbey was born in Mechanicsville, Carroll county, Ohio, June 14, 1843. In 1876 he began the study of dentistry in the office of Dr. J. G. Templeton, Pittsburg, and in 1880 was graduated at the Pennsylvania College of Dental Surgery and began practice in Pittsburg, Pa.

Dr. Libbey stood among the foremost of the dental profession in Pennsylvania, and was one of the best known and most popular dentists in the vicinity where he practiced. He was associated in the same office, although not in partnership, with his brother, Dr. J. A. Libbey, for many years, working at an adjacent chair and devoting his time exclusively to operative work, as he never took interest in nor sought patronage in the prosthetic line. Through his naturally retiring disposition he had no ambition for nor would he accept any position of prominence in connection with dental society work, although he was an active and interested member of the Pennsylvania State Dental Society and of the Odontological Society of Western Pennsylvania. Dr. Libbey was always ready to assist in any movement for the advancement of his chosen profession and did everything he could for the improvement thereof.

In nature and temperament he was genial and companionable, the soul of integrity, and honorable in all his dealings. He numbered among his *clientèle* many patients of high standing and influence, whose loyalty to him was the best evidence of his high personal and professional character. He will be greatly missed not only by those who relied on him for his watchful and efficient care of their interests, but by his colleagues and many friends in the dental profession at large.

Dr. Libbey was married June 4, 1878, at Carnegie, Allegheny county, Pa., to Miss Mary E. McLean, who with one son survives him.

DR. F. W. BLOMILEY.

DIED, at Sioux Falls, So. Dak., January 27, 1903, F. W. BLOMILEY, D.D.S.

Dr. F. W. Blomiley was born in LaGrange Wis., August 3, 1849. He began the practice of dentistry in Elkhorn, Wis., in the year 1878 and graduated from the Indiana Dental College in March 1882. He returned to Elkhorn and continued in practice there until January 1885, when he removed to Sioux Falls, So. Dak., where he pursued the practice of his profession until the time of his death. Dr. Blomiley was one of the pioneer dentists of the state, being one of the first members of the South Dakota State Dental Society.

He was a constant sufferer for thirty years from chronic dyspepsia, but his untiring energy kept him at his post until the day before his death.

The South Dakota State Dental Society, at its last meeting in Redfield, voted that the secretary be authorized to insert an obituary notice of Dr. Blomiley in some of the leading dental magazines in circulation in the West.

DR. HOWARD H. OLNEY.

DIED, at Leavenworth, Kans., August 2, 1903, Dr. HOWARD H. OLNEY, from tubercular abscess, in his forty-sixth year.

Dr. Olney was born at West Jefferson, Ohio, July 10, 1857. He began the study of dentistry as a pupil of his brother, Dr. F. E. Olney, at Warsaw, Ind., with whom he re-

mained until 1881, when he began practicing for himself at Spencerville, Ohio, later removing to Day Center, Kans., where he enjoyed the leading practice.

Seeking a larger field of labor, he located at Leavenworth, Kans., in 1895. Here his genial manner and professional attainments soon won for him a lucrative practice. Dr. Olney was married at Delaware, Ohio, June 17, 1885, to Miss Florence Deal, whose death occurred in 1889. In 1890 he married Miss Alice Deal, who with six children survives him.

DR. JOSEPH WOOD SAWYER.

DIED, at Saugus, Mass., October 30, 1902, Dr. JOSEPH WOOD SAWYER.

Dr. Sawyer was born in Boston, Mass., August 19, 1844. In 1858, at the age of fourteen years, he entered the office of Drs. Ball and Fitch, Beacon street, Boston, Mass., as a dental student, continuing his studies with Dr. Mason of Boston, under whose preceptorship he placed himself in 1861. When the civil war broke out he enlisted with the Nineteenth Massachusetts Volunteers, taking his dental instruments with him and acting in the capacity of dentist among the members of Company I, to which he belonged. He was discharged later for disability and returned home and engaged in the practice of dentistry with Drs. O. C. White and Thresher. He, however, enlisted in the service of his country the second time, joining the Sixty-first Massachusetts Volunteers, serving with his regiment until the close of the rebellion, and then returned to civil life after the grand review at Washington.

In 1866 Dr. Sawyer engaged in the practice of dentistry on Winter street, Boston, where he succeeded Dr. Dillingham, removing thence to 169 Tremont street, occupying an office with Dr. Hitchcock, where he remained for more than twenty-five years, finally removing in 1902 to the Walker Building, where he continued to practice until the time of his death.

Dr. Sawyer was twice married, his first wife being Miss Annie Isabel Barton, and his second wife, Miss Florence M. Teele. The latter and one son survive him.

SOCIETY NOTES AND ANNOUNCEMENTS.

UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

FOURTH INTERNATIONAL DENTAL CONGRESS.

August 29 to Sept. 3, 1904.

Committee of Organization Dental Congress.

H. J. BURKHART, Chairman.

E. C. KIRK, Secretary.

R. H. HOFHEINZ,	J. W. DAVID,
WM. CARR,	WM. CRENSHAW,
W. E. BOARDMAN,	DON M. GALLIE,
V. E. TURNER,	G. V. I. BROWN,
J. Y. CRAWFORD,	A. H. PECK,
M. F. FINLEY,	J. D. PATTERSON,
B. L. THORPE.	

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

- I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer.
- II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.
- III. Chemistry and Metallurgy. Chairman, J. D. Hodgen.
- IV. Hygiene, Prophylaxis, Therapeutics, Materia Medica, and Electro-therapeutics. Chairman, A. H. Peck.

DEPARTMENT B—APPLIED SCIENCE.

- V. Oral Surgery. Chairman, G. V. I. Brown.
- VI. Orthodontia. Chairman, E. H. Angle.

VII. Operative Dentistry. Chairman, C. N. Johnson.

VIII. Prosthesis. Chairman, C. R. Turner.

IX. Education, Nomenclature, Literature and History. (To be appointed.)

X. Legislation. Chairman, Wm. Carr.

COMMITTEES.

The following committees were appointed:

Finance. Chairman, C. S. Butler.

Program. Chairman, A. H. Peck.

Exhibits. Chairman, D. M. Gallie.

Transportation. (To be appointed.)

Reception. Chairman, B. Holly Smith.

Registration. Chairman, B. L. Thorpe.

Printing and Publication. Chairman, W. E. Boardman.

Conference with State and Local Dental Societies. Chairman, J. A. Libbey.

Dental Legislation. Chairman, Wm. Carr.

Auditing. (Committee of Organization.)

Invitation. Chairman, L. G. Noel.

Membership. Chairman, J. D. Patterson.

Educational Methods. Chairman, T. W. Brophy.

Oral Surgery. Chairman, G. V. I. Brown.

Prosthetic Dentistry. Chairman, C. R. Turner.

Local Committee of Arrangements. (To be appointed.)

Essays. (To be appointed.)

History of Dentistry. Chairman, Wm. H. Trueman.

Nomenclature. Chairman, S. W. Foster.

Promotion of Appointment of Dental Surgeons in the Armies and Navies of the World. Chairman, Wms. Donnally.

Care of the Teeth of the Poor. Chairman, Thomas Fillebrown.

Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.

Prize Essays. Chairman, James Truman.

Oral Hygiene, Prophylaxis, Materia Medica, Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck.

Operative Dentistry. Chairman, C. N. Johnson.

Resolutions. Chairman, J. Y. Crawford.

Clinics. Chairman, C. E. Bentley.

Nominations. (To be appointed.)

Local Reception Committee. (To be appointed.)

Ad interim. Chairman, G. V. I. Brown.

The officers of the Congress, president, vice-presidents, secretary, and treasurer, will be elected by the Congress at large at the time of the meeting, and will be nominated by the Nominating Committee.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,

E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.

DAVID R. FRANCIS, *President of Exposition*.

NORTHERN INDIANA DENTAL SOCIETY.

THE Northern Indiana Dental Society will hold its annual meeting at Wabash, Indiana, September 15 and 16, 1903.

J. A. STOECKLEY, *Sec'y*, South Bend, Ind.

FIRST DISTRICT DENTAL SOCIETY OF ILLINOIS.

THE twenty-first annual meeting of the First District Dental Society of Illinois will be held in Macomb, Tuesday and Wednesday, September 15 and 16, 1903.

The profession is cordially invited to attend.

H. W. McMILLAN, *Sec'y*, Roseville, Ill.

SIXTH DISTRICT (N. Y.) DENTAL SOCIETY.

THE thirty-fifth semi-annual meeting of the Sixth District Dental Society of the state of New York will be held at Norwich, Chenango county, on October 8 and 9, 1903.

FREDERIC W. MCCALL, *Sec'y*, Binghamton.

SOUTHWESTERN IOWA DENTAL SOCIETY.

THE seventh annual meeting of the Southwestern Iowa Dental Society will be held on October 13 and 14, 1903, at Albia, Iowa.

J. A. WEST, *Sec'y*, Creston, Iowa.

NEW JERSEY BOARD OF REGISTRATION.

THE State Board of Registration and Examination in Dentistry of New Jersey will hold their semi-annual examination in the assembly room of the State-house at Trenton, N. J., on the 20th, 21st, and 23d of October 1903. All applicants are required to file their application with the secretary ten days prior to the examination. Sessions begin promptly at 9 A.M. each day. For information in regard to examination communicate with the secretary, 29 Fulton street, Newark, N. J. Fee for examination twenty-five dollars.

CHAS. A. MEEKER,
Sec'y Dental Commission.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE annual meeting of the National Association of Dental Examiners was held at Asheville, N. C., July 24, 25, and 27, 1903.

The following state boards were represented by delegates: Alabama, Arkansas, Connecticut, District of Columbia, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Virginia, and Wisconsin.

Among the important features of the meeting were the reports of state boards on the maintenance and enforcement of the law in their respective states, their scrutiny of the colleges, and the discussion of the subject of reciprocity in the interchange of certificates. The result of that discussion was the adoption of a resolution to the effect that it was the sense of the meeting that reciprocity should be secured whenever possible.

Considerable time was occupied in the consideration of the feasibility of the National Association of Dental Examiners preparing its own list of recognized colleges instead of depending, as heretofore, upon that of the National Association of Dental Faculties; and eventually a resolution was adopted to the effect that where fifty per cent. of the graduates of any college fail to pass the state board, such college be stricken from the recognized list.

The report of the Committee on Colleges resulted in the adoption of a resolution decrying the practice of graduating students at any time other than that of the regular commencement.

The following officers were elected: Burton Lee Thorpe, St. Louis, Mo., president; James L. Reid, Chicago, Ill., vice-president from the West; J. Tenney Barker, Wallingford, Conn., vice-president from the East; T. P. Whitby, Selma, Ala., vice-president from the South; Chas. A. Meeker, Newark, N. J., secretary and treasurer.

Chairmen of Committees: Committee on Colleges—Chas. C. Chittenden, Madison, Wis. Committee on Conference—John F. Dowsley, Boston, Mass. Membership Committee—Frank E. Moody, Minneapolis, Minn. State

Advisory Committee—Henry Barnes, Cleveland, Ohio. Committee for Promoting Relations with Foreign Examiners—Wm. Carr, New York, N. Y. Committee on Resolutions—R. H. Jones, Winston, N. C. Committee on Codification of Laws—George E. Mitchell, Haverhill, Mass. Committee on Publication—M. A. Mason, Indianapolis, Ind. Committee on Contracts, etc.—H. S. Vaughn, Kansas City, Mo. Press Committee—J. Robert McGraw, Fayette, Mo. Reception Committee—Robert M. Burgess, Paris, Mo.

CHAS. A. MEEKER, *Sec'y.*

BOSTON AND TUFTS DENTAL ALUMNI ASSOCIATION.

AT the annual meeting of the Boston and Tufts Dental Association, held June 16, 1903, the following officers were elected: J. W. Forbes, president; W. I. Brigham, first vice-president; I. J. Wetherbee, second vice-president; M. L. Woodward, recording secretary; G. B. Squires, corresponding secretary; Wm. Rice, treasurer; J. R. Piper, editor. Executive Committee—H. H. Piper, F. S. Fogg, E. A. Johnson, F. B. Stevens.

G. B. SQUIRES, *Cor. Sec'y.*

ALAMEDA COUNTY (CAL.) DENTAL SOCIETY.

ON May 3, 1903, the name of the "Oakland Dental Club" was changed to that of the Alameda County Dental Society. The success of the monthly meetings of the past two years has inspired the executive committee and officers to broaden the field of work. Of the forty members, many are residing in Alameda, Haywards, and Berkeley, and it is the desire to include among the members all ethical dentists practicing in the county.

Besides the other interesting features of this year's work a series of clinics is to be given by members of the society. A limited number of able practitioners from San Francisco and elsewhere, not members of the society, will be asked to participate. An evening of "Eye, ear, nose, and throat," an evening of "Orthodontia," and one devoted to "Anesthetics" are among the good things promised.

JOSEPH LORAN PEASE, *President.*
J. C. GILBERTSON, *Secretary.*

MINNESOTA BOARD OF DENTAL EXAMINERS.

THE next meeting of the Minnesota State Board of Dental Examiners will be held October 6th, at the Dental Department of the State University at Minneapolis, Minn.

Candidates should bring their diplomas, also instruments for insertion of a gold filling.

F. E. MOODY, *Pres't*, Minneapolis, Minn.

C. H. ROBINSON, *Sec'y*, Wabasha, Minn.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

THE sixth annual meeting of the Southern California Dental Association will be held in Los Angeles, at the Dental College of the University of Southern California, on Monday and Tuesday, September 28 and 29, 1903. All ethical practitioners are cordially invited to attend.

LEWIS E. FORD, *Sec'y*,
307 So. Broadway, Los Angeles, Cal.

HARVARD DENTAL ALUMNI ASSOCIATION.

AT the thirty-second annual meeting of the Harvard Dental Alumni Association, held in Boston, Mass., on Monday, June 22, 1903, the following officers were elected: Charles E. Perkins, '90, Brockton, Mass., president; Arthur H. Stoddard, '87, Boston, Mass., vice-president; Waldo E. Boardman, '86, Boston, Mass., secretary; E. Proctor Holmes, '88, Boston, Mass., treasurer. Executive Committee—Waldo E. Boardman, '86 (*ex officio* chairman); William P. Cooke, '81 (for two years); Harry S. Parsons, '92 (for one year).

WALDO E. BOARDMAN, *Sec'y*, Boston, Mass.

OKLAHOMA DENTAL ASSOCIATION.

AT the thirteenth annual meeting of the Oklahoma Dental Association, held in Oklahoma City, May 12 and 13, 1903, the following officers were elected for the ensuing year: F. H. Colter, president; R. H. Pendleton, vice-president; Theo. P. Bringham, secretary and treasurer.

The next meeting will be held at Shawnee, O. T., in May 1904.

THEO. P. BRINGHURST, *Sec'y*,
Shawnee, O. T.

TEXARKANA DENTAL SOCIETY.

THE dentists of Texarkana, Ark. and Tex., have organized a society, to be known as the Texarkana Dental Society, which is making satisfactory progress.

Following is a list of the officers and members: P. A. Skeen, president; T. A. Sims, vice-president; A. E. Chambers, secretary and treasurer; J. B. Reed, F. D. Bittle, J. L. Mosely, L. W. Dancy, and A. Crossley.

A. E. CHAMBERS, *Sec'y*.

COLORADO STATE DENTAL ASSOCIATION.

AT the annual meeting of the Colorado State Dental Association, held in the Brown Palace Hotel, Denver, Colo., June 16, 17, and 18, 1903, many interesting papers were read and clinics presented.

The following officers were elected for the ensuing year: E. W. Varley, Pueblo, president; F. Y. Herbert, Denver, vice-president; Wm. Smedley, Denver, treasurer; Harry W. Bates, Denver, secretary.

HARRY W. BATES, *Sec'y*,
237 Majestic Bldg., Denver, Colo.

MISSISSIPPI DENTAL ASSOCIATION.

AT its last meeting in Vicksburg the Mississippi Dental Association elected the following officers: J. B. Askew, Jr., Vicksburg, president; Jno. S. Dupree, Holly Springs, vice-president; T. B. Wright, Hattiesburg, secretary; P. P. Walker, Brandon, assistant secretary; C. C. Crewden, Kosciusko, treasurer.

The association will meet in Jackson next year.

T. B. WRIGHT, *Sec'y*, Hattiesburg, Miss.

WISCONSIN STATE DENTAL SOCIETY.

AT the thirty-third annual meeting of the Wisconsin State Dental Society, held at Superior, Wisconsin, July 21, 22, and 23, 1903, the following officers were elected: A. G. Fee, Superior, president; F. G. Van Stratum, Hurley, first vice-president; J. V. Miller, Manitowoc, second vice-president; W. H.

Mueller, Madison, secretary; Adolph Gropper, Milwaukee, treasurer.

The next meeting will be held at Manitowoc, on the third Tuesday in July, 1904.

W. H. MUELLER, *Sec'y*, Madison, Wis.

ARMY DENTAL CORPS.

LEAVE for one month, to take effect on or about September 1, 1903, is granted Contract Dental Surgeon George M. Decker, Fort Logan, Colo. (August 5, Dep't Colo.)

Contract Dental Surgeon Emmett J. Craig,

now at San Francisco, Cal., is relieved from further duty in the Philippines, and will report in person to the commanding general, Department of California, for temporary duty. (August 11, H. Q. A.)

Contract Dental Surgeon Douglas E. Foster, now at San Francisco, is relieved from further duty in the Philippines, and will proceed to Governor's Island, N. Y., for duty. (August 11, H. Q. A.)

Sick leave for one month, to take effect August 9, 1903, is granted Contract Dental Surgeon William C. Hammond, Presidio of San Francisco. (August 3, Dep't California.)

DENTAL COLLEGE COMMENCEMENTS.

STATE UNIVERSITY OF IOWA, COLLEGE OF DENTISTRY.

THE twenty-first annual commencement exercises of the College of Dentistry of the State University of Iowa were held on Wednesday, June 17, 1903.

An address was delivered by the Hon. Geo. Frisbie Hoar, LL.D.

The degree of D.D.S. was conferred by the president on the following graduates:

Edgar Bailey.....	Iowa.	Will Merriman Hiett.....	Iowa.
Fritz Smith Beckman.....	Minnesota.	Alfred Horrabin.....	Iowa.
Clarence Evander Beeman.....	Iowa.	Harry Pirnetti Houser.....	Iowa.
Frank Joseph Bell.....	South Dakota.	Walter Edward Keehl.....	Iowa.
Lee Fisk Bigger.....	Iowa.	Joseph Clarence Kepford.....	Iowa.
Clarence Aubrey Brown.....	Iowa.	Henry Frederick Lange.....	Iowa.
Floyd Chester Clark.....	Iowa.	Arthur C. Lee.....	Iowa.
Irving Gardner Crowell.....	Wisconsin.	Charles Edwin Meyer.....	Iowa.
Eunice Elizabeth Daly.....	Iowa.	William Joseph Meade.....	Iowa.
Courtland Alva DeLano.....	Iowa.	Francis Ellbriggs Munger, Jr..	Iowa.
Warren Duncan.....	Iowa.	Howard Herman Quaife.....	Iowa.
Walter Lyle Dunning.....	Iowa.	Elmer George Rittler.....	Iowa.
Gideon Charles Ellis.....	Iowa.	Burt Ray Sawyer.....	South Dakota.
William Kirk English.....	Minnesota.	Howard Ritchie Shannon.....	Iowa.
Chester Fordyce.....	Iowa.	William Arthur Sherman.....	Iowa.
Oscar Harley Gallagher.....	Iowa.	Charles James Swan.....	South Dakota.
Oliver Nelson Greene.....	Iowa.	Clarence Cary Waud.....	Iowa.
Calvin Waldo Harned.....	Iowa.	Samuel C. Williams, B.S. 1901.	Iowa.
Albert S. Harper.....	Iowa.	Craton Donald Wyckoff.....	Iowa.
Dave Mitten Hemminger.....	Pennsylvania.		

SCHOOL OF DENTISTRY, UNIVERSITY OF ILLINOIS.

THE second annual commencement exercises of the School of Dentistry, University of Illinois, were held in Steinway Hall, Chicago, April 30, 1903.

Addresses were delivered by Edward A. B. Hanna, Steven Richard Bawden, D.D.S., and Rev. L. A. Crandall.

The degree of D.D.S. was conferred by Andrew S. Draper, LL.D., president, on the following graduates:

Lysle Edwin Adams.	Francis Albert Holly.	Guy Stanley Peck.
Conrad Frederick Altinberg.	Edward Hulla.	Wm. Morton Post.
Edward Walter Applegate.	Elmer Nichols Johnson.	Niels Peter Rasmussen.
Steven Richard Bawden.	William Henry Karcher.	John Edward Reinbold.
John Henry Bond.	Joseph Daniel McElroy.	Frank John Ryan.
Alfred Alexander Broman.	Alfred Leland Harlan Mann.	James Scott.
Harry Cadwallader.	Tekla Maturzynski.	Thomas Harvey Sprague.
John Oscar Erlands.	James Emmet Monahan.	Frank Murray Stahl.
Charles Alfred Finley.	Martin Guy Murray.	Frederick Holstein Swartz.
Leo Gottlieb.	Alden Richard Newlin.	William Frank Taylor.
Arthur Raymond Greenfield.	Veo Erwin O'Neil.	William Henry Taylor.
Oscar Jacob Hammersmith.	Seymour Davis Paden.	George Horace Wardner.
Edward Alphonso B. Hanna.	George Fred Palmer.	Charles Edward Waterman, Jr.
Harlow Henry Hill.		

COLORADO COLLEGE OF DENTAL SURGERY.

THE annual commencement exercises of the Colorado College of Dental Surgery, Dental Department of the University of Denver, were held on Monday, May 18, 1903, at Trinity M. E. Church, Denver.

Addresses were delivered by W. T. Chambers, D.D.S., dean, and by E. R. Warner, M.D., D.D.S., and the valedictory by Albert Thoman Arthur, D.D.S.

Henry A. Buchtel, D.D., LL.D., chancellor, conferred the degree of D.D.S. on the following graduates:

Samuel S. Aber.....	Russia.	Edwin E. McClintock.....	North Dakota.
Albert Thoman Arthur.....	Colorado.	William Arthur Marshall....	Kansas.
Mallory Catlett.....	Mississippi.	John Bracken Pulford.....	Colorado.
Walter Hinman Chamberlain.	Colorado.	William Alburtus Pursell....	Kentucky.
William Mallory Fisher.....	Kansas.	Joseph Moulton Rogers.....	Massachusetts.
William Horace Flint.....	Oregon.	Henry Edmund Tisch.....	Wisconsin.
William D. Flory.....	California.	Chas. A. Walker.....	Texas.
Edwin A. W. Hedge.....	Colorado.	Frederic Emery Ward.....	Colorado.
Alton Lee Kempton.....	Nova Scotia.	Ralph Ellis Wool.....	California.

SOUTHERN DENTAL COLLEGE, ATLANTA, GA.

THE sixteenth annual commencement exercises of the Southern Dental College were held in the Grand Opera House, Atlanta, Ga., April 29, 1903:

The address to the graduates was delivered by Mr. F. O. Foster, of The S. S. White Dental Manufacturing Co.

The degree of D.D.S. was conferred by Judge Howard Van Epps, president of the board of trustees, on the following graduates:

W. E. Allen.....	Alabama.	Z. V. Parker.....	North Carolina.
C. T. Brockett.....	Georgia.	J. W. Pendrey.....	Alabama.
R. B. Brooks.....	Alabama.	E. H. Pound.....	Florida.
M. K. Ford.....	Alabama.	J. O. Maner.....	Georgia.
H. C. Fountain.....	Alabama.	C. A. Ray.....	Mississippi.
J. L. Hamilton.....	South Carolina.	F. L. Rountree.....	Georgia.
S. E. Green.....	Georgia.	C. A. Roberts.....	Texas.
W. M. Henry.....	Louisiana.	O. L. Rudisail.....	Georgia.
Wm. W. Hoagland.....	Colorado.	Manuel Samaniego.....	Mexico.
B. O. Holman.....	Alabama.	W. M. Searcy.....	Georgia.
D. F. Jones.....	Alabama.	J. W. Stanley.....	North Carolina.
W. J. Lanford.....	Georgia.	J. W. Thompson.....	North Carolina.
J. A. McDaniel.....	North Carolina.	R. H. Thomas.....	Georgia.
T. B. Mathews.....	South Carolina.	R. B. Walker.....	Alabama.
E. B. Morrison.....	South Carolina.	N. A. Williamson.....	Tennessee.
I. D. Nettles.....	Louisiana.		

UNIVERSITY OF MICHIGAN, DENTAL DEPARTMENT.

THE fifty-ninth annual commencement exercises of the Dental Department of the University of Michigan were held on Thursday, June 18, 1903.

The commencement oration was delivered by Hon. Joseph Very Quarles.

The degree of D.D.S. was conferred on the following graduates:

Richard Allan.	Frank Archie Graham.	Charles Homer Robison, B.S., <i>Michigan Agricultural Coll.</i>
Francis Gordon Anspach.	Wilfred Morgan Hawkins.	Arthur Dodwell Saunders.
Ernest Ellsworth Argetsinger.	Claude Prindle Hildreth.	Arthur Henry Savage.
Charles Henry Baker.	Willis Scott Howlett.	Halsey Caleb Sayrs.
Robert Clifton Baker.	Eugene William Johnson.	William Frederic Setzler.
George Watson Baylis.	Louis John Kennedy.	Frank Elliott Sharp.
Sigurd Becker.	William Webster Kimmel.	Frank Kaye Steen.
Mabelle Marie Bennett.	Peter Cornelius Krupp.	Anna Stukey.
Carl Henry Borgmeier.	William James Larder.	Peter Stukey.
Joseph Michael Brown.	Harrold Byron Lehner.	Nicholas Louis Swykert.
Charles Joseph Burke.	Willis Albert Litle.	Irvin Lynn Terry.
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	Harry Wells Putnam.	
	Arthur Rickel.	

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JULY 1903.

<i>July 7.</i>	No. 733,321, to WILLIAM E. GRISWOLD. Dental jig.
No. 732,922, to EGBERT A. CLARK. Pivot-pin for teeth.	<i>July 14.</i>
No. 732,949, to LEONARD G. KOENIG. Polishing cone and wheel.	No. 733,410, to EDMUND B. MARSHALL. Rubber-dam holder.
No. 733,026, to SYDNEY O. GOLDAN. Inhaler.	No. 733,807, to LUTHER L. BOSWORTH. Friction gearing for dental machines.
No. 733,027, to SYDNEY O. GOLDAN. Inhaler.	<i>July 21.</i>
No. 733,061, to LEO. C. MANDEL. Composition for dentist's tapers.	No. 734,072, to PHILIP B. LASKEY. Dental clamp.
No. 733,320, to WILLIAM E. GRISWOLD. Dental securing device.	<i>July 28.</i>
	No. 734,865, to GEO. K. HEIST. Crown-slitter.



H. C. Barrett

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ORIGINAL COMMUNICATIONS.

THE APPLICATION OF ORTHODONTIA PRINCIPLES TO THE PREVENTION OF NASAL DISEASE.

By **GEORGE V. I. BROWN, A.B., D.D.S., M.D., C.M., Milwaukee, Wis.**

(Read before the Iowa State Dental Society, at its annual meeting, Des Moines, May 6, 1902.)

THE orthopedic surgeon has developed to a high degree of perfection both apparatus and methods of treatment in correction of deformities of the spine and extremities. Such efforts have long been considered worthy of the best energies of the brightest minds of the medical profession; but, beyond sporadic individual effort, little progress seems to have been made with reference to special care for readjustment of the bones of the face and jaws. Although dentists have reduced orthodontia methods to great systematic perfection in the correction of irregularities of the teeth, unfortunately such efforts are for the greater part devoted to purely cosmetic results, and great possible benefits are thus overlooked or not at all comprehended. Yet no part of the human osseous structure is subject to greater variation from the normal, nor, if rightly considered, may the general ill result be more marked than from deformities of the bones of the face, and more especially those in their relation to the nasal bones and the lower jaw.

DIVISIONS OF THE SUBJECT.

The questions which chiefly concern our subject are—

- (1) Causes of nasal asymmetry.
- (2) How may the arrest of development or imperfect form of facial bones favor pathological nasal conditions?
- (3) Frequent possibility of beneficial interference by corrective treatment.
- (4) Methods best applied in the process of readjustment.

DEVIATIONS OF NASAL SEPTA; LITERATURE AND ETIOLOGIC THEORIES.

The literature pertaining to the etiology of deflections of the nasal septum is identical with that of any other deformity. A large number of writers have given the subject much consideration and many ingenious explanations have been brought forward in support of particular causative factors.

It is, I believe, safe to say that no etiologic reasoning can support a theory dependent upon a single cause. Probably no writer has covered more com-

pletely the ground of research upon this and kindred subjects than has Talbot, who, in his examinations of crania, both upon the cadaver and upon living persons, has gathered together a vast number of facts concerning heredity, racial characteristics, mixing of races, fractures both before and after birth, diathesis, specific and infectious diseases, inflammatory affections, respiration, mouth-breathing, high palatal vaults, etc., all of which directly bear on this relation.

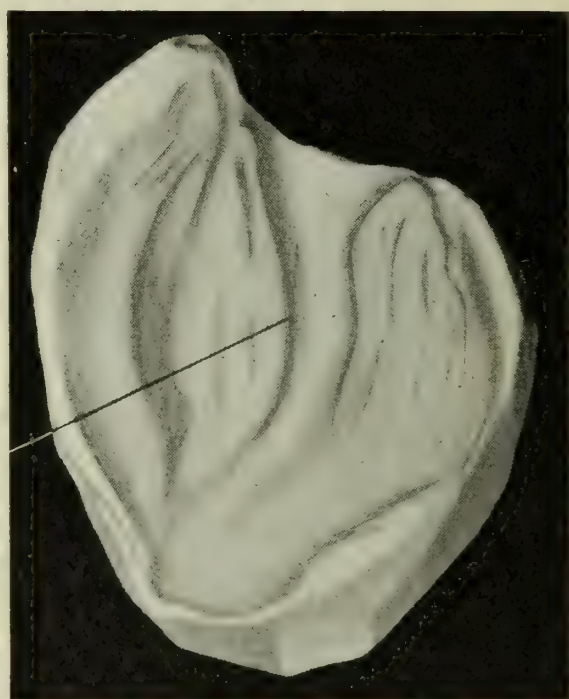
Cryer—whose dissections of skulls and studies of the internal anatomy of the face have called attention to many erroneous but long-accepted theories and led to valuable improvement in nasal, facial, and oral surgical procedures—says, with reference to asymmetry: "There are even variations in the same individual in the shape, size, and markings of the two sides of the face. In the bilateral bones, such as the frontal, sphenoid, vomer, ethmoid, and mandible, one side is usually found to differ from the other. In the homonymous bones, as the maxillæ, the malar, the lacrymal, the turbinate, and the palate bones, the same variations are observed. This being the case, it will be readily understood that the internal openings and spaces, as the mouth, the nasal chambers, the orbits, the maxillary, frontal and sphenoidal sinuses, the ethmoidal and other cells, will differ accordingly."

It seems to be the case that as the cranial cavity increases, in the evolutionary order of development, whether in man or animals, there is a corresponding tendency to decrease in the size and length of the maxillary and other bones of the face and jaws. Difference in the manner of producing and preparing food, with the advance to higher civilization, has very largely removed the necessity for massive and powerful teeth. The manner of their use in the living requirements of the present day are not such as tend by constant exercise to such development. We know that the skulls of some aboriginal races show four molars instead of three as in the human jaw of the present day; and, frequently,

even the third molar is never erupted, or it has such imperfect development, or makes its way in the effort of eruption with such great difficulty, owing to insufficient space from the smallness of the jaws, that one can hardly doubt the likelihood of its ultimate disappearance.

Talbot says: "Deviation of the nasal septum to one side or the other is the result of unequal development of adjacent bony parts, more especially and directly of that of the turbinated bones.

FIG. 1.



It depends largely, if not exclusively, upon the development and position of these latter. They in turn are dependent in great measure upon the development of the facial bones, which are modified as the facial angle increases and prognathism is lost. The turbinated bones being as it were exostosed, not molded in many directions by adjacent parts, encroach more irregularly upon the nasal cavity as their origins are disturbed or dislocated."

We know that in all variations from developmental processes that result in anatomical forms which may be conceived under the relative term "normal," there must obviously be, or there has been, some perversion of the physiologic processes which if unimpeded would be

productive of a perfect individual, or one of typical form. These factors are—

(a) Degeneracy, or its antithetic atavistic tendency.

(b) Perverted cell-function from other causes, which necessarily includes imperfect metabolism, insufficient nutrition, etc.

(c) Application of force. This may be in the nature of muscular activity in the performance of normal functions, or

are almost invariably associated with adenoid vegetations, mouth-breathing, and deviations of nasal septa, but it has been very clearly shown that many such irregular forms are to be found where palates, and even dental arches, are quite normal in form. Moreover, Talbot in his investigations has shown very clearly that such palates frequently exist by reason of elongations of the alveolar borders, which produce in effect this result

FIG. 2.



FIG. 3.



through unusual action due to habit, to nervous affections, or irregular points of attachment altering the direction of the muscular strain.

(d) External forces: traumatism, disease, or other injury.

V-SHAPED VAULTS.

Among the reasons given for deviations of the nasal septa, the high narrow palatal arch has been held to be an etiologic factor, because it was believed that the increase in height of the vault was at the expense of space above. Consequently, the vomer was crowded up and in that way bulged to one side or the other, or became sigmoid in form because of insufficient room for development. There can be no question about the fact that palate vaults of this shape

without crowding upward the central portion of the mouth.

It is doubtless correct to assume that the passage of air during the warming process of inhalation has much to do with the development of the turbinated bones, and they in turn exercise a radical influence upon the thin separating wall of the septum; but that this does not altogether account for such variation is shown by Fig. 1, the case of the mouth of a baby six weeks old, with cleft-palate deformity, in which the inferior turbinate is much enlarged, as is frequently the case with these patients, and it will readily be seen by a picture (Fig. 2) of the same baby that the entire nasal cartilage, including the septum, is pulled forward and away on the side upon

which this unusual turbinated development exists.

Fig. 3 shows same baby a few months after operation, with nose straight; and, as may be seen, the child is no longer a mouth-breather, a fact which signifies that the septum must be nearly or quite normal.

Figs. 4, 5, and 6 illustrate another case similar, with characteristic deflection, and breathing freely through the nose after operation.

Dr. Nelson M. Black, a recent writer, gives the following explanation regarding the influence of the palatal arch upon deviated nasal septa:

FIG. 4.



"Taking into consideration the development of the several bones involved, we find that at birth the ethmoid consists of two lateral masses, which are small and ill-developed. The horizontal and perpendicular plates begin to ossify at about the first year after birth, and the lateral masses become joined to the cribriform plates. The formation of the ethmoid cells, which completes the bone, does not commence until about the fourth or fifth year. The vomer, which consists of two laminae, commences to ossify from a single center, beginning to coalesce at the lower part, but the union is not complete until after pu-

berty. The superior maxillæ begin to ossify at a very early period, but the suture between the palate processes at their junction with the vomer persists

FIG. 5.



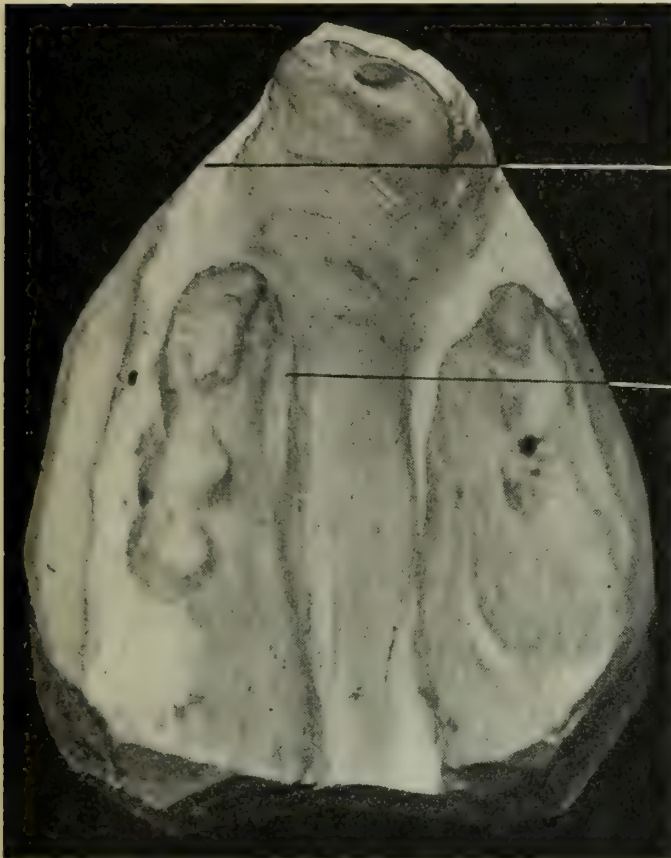
FIG. 6.



until middle life. Thus the lower arch, with its two arcs, is fairly well formed at birth, with a joint at the junction of the 'keystone,' which is not solid and which supports the perpendicular plate, which is partly cartilaginous up to puberty; and the triangular cartilage, which completes the septum, is firmly

held in bony surroundings for fully two-thirds of its circumference, besides its muscular and facial attachments.

FIG. 7.



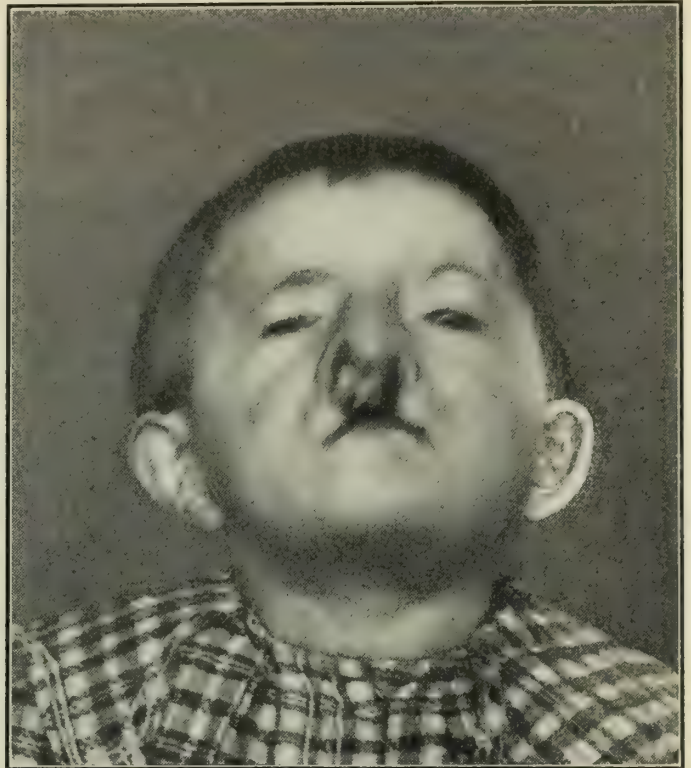
“To my mind, if simple pressure is applied in the right direction to the arch supports or upper teeth, the natural law of force will produce deflection of the cartilaginous portion and of the bony portion of the septum, provided that the perpendicular plate of bone cannot resist the force. This it cannot do if it is an abnormal condition as a result of injury or disease.”

ALTERATION DUE TO MUSCULAR STRAIN.

That unopposed muscles can alter the form and structure of the septum is shown by both cast and picture of a typical case of neglected double hare-lip and cleft palate, shown in Figs. 7 and 8. Instead of a thin, almost transparent wall, it was found in this case that, in order to restore natural form to the features, nearly an inch and a half of solid bone, varying from one-third to one-half inch in thickness, had to be removed. (See marks in Fig. 7.)

Fig. 9 shows a similar case, in which a surgeon has made the fatal error of removal of the intermaxillary bone in a fu-

FIG. 8.



tile attempt to close the lip, but it will be noticed that the nose is reasonably straight because the muscular action

FIG. 9.



which caused deflection in all the other cases was thus destroyed. These are typical cases and could be multiplied by way of illustration almost indefinitely, if

it were necessary to do so. The principles underlying the causation of these distortions of form in the abnormal character of bony growths are not well understood, and it would seem as though their proper consideration were a matter of the first importance when applied to

to exert a controlling influence upon the form of the face throughout years of developmental progress and even later, in fact continuing during life, through the powerful action of the masticatory muscles in the acts of sucking and of mastication, and in the nervous activity ex-

FIG. 10.



the prevention and treatment of the less extensive, but far more frequent and therefore much more often injurious, perversions in the form and development of the nasal bones.

MUSCULAR FORCE EXERTED FROM BIRTH.

This leads us to consider the fact that from the moment of birth there begins the constant action of a force destined

pressed in grinding or clenching the teeth.

LOWER JAW AT BIRTH.

When it is remembered that the lower jaw at birth is much larger than the upper, and also that the bones of the face are much smaller proportionately at this period than those of the head, it will readily be conceded that constant pushing upward of the wedge-shaped

maxillary between the superior maxillary bones—increasing their development antero-posteriorly as well as laterally—must exercise a radical influence not only upon these, but also upon all the bones that are associated to form the nasal meati and the nasal septum which divides them. Thus the nasal, maxil-

changed by any misdirection of energy which may cause in this dividing wall a deviation from its normal position or form.

EFFECT OF PRESSURE ON LIVING BONES.

It is a well-understood fact that the bones of the young, during the formative

FIG. 11.



lary, lacrymal, ethmoid, inferior turbinated, palate, and sphenoid bones, which form the nasal meati, are affected in shape and relation by any forces which would alter the position of their respective relations to their surroundings; and so, in a similar manner, are the vertical plates of the ethmoid, vomer, the crests of the maxillæ and the palate bones, the rostrum of the sphenoid and the nasal spine of the frontal bone—which combine to form the nasal septum in all save its triangular notch of nasal cartilage—

period, yield readily to pressure, and can be changed to almost any reasonable degree in outline and direction; also, that in adult life steadily exerted pressure will bring about absorption at the point of irritation, if not sufficiently severe to cause extensive inflammation; and again, the work of the osteoclasts is followed by osteoblasts with the result that the desired form is retained.

This is particularly true of the alveolar processes, and has been clearly demonstrated by Talbot in his work upon

dogs. It is illustrated in Fig. 10 by a very remarkable example in form and structure due to unusual muscular strain. This individual received a burn at three years of age and was neglected until the age of twenty-one years, his chin, breast, and left hand being bound together by cicatricial bands. An unnatural action of opposing muscles during the intervening years caused not alone a distortion of the face, as shown in the picture, but a change in the form of the jaws to such an extent that the molars of the inferior jaw occluded with the canine above. Not only was the lower jaw elongated and straightened in shape, but there was also an increase of bone structure developed to such an extent that, in operating for correction of the deformity, it was found possible to cut off all the anterior portion of the jaw, including the teeth from the first bicuspid on one side to the second bicuspid on the other, while yet there was bone enough to enable us to form a fairly good imitation of the mental process, and leave what appears to be in effect something like a natural jaw, as in Fig. 11. (The anterior lower teeth were supplied by bridge work.)

These may seem to be somewhat exaggerated examples, but they are all cases in my own practice, and because of their striking features and known etiology, they serve better than any others to indicate the etiologic principles of lesser deformities.

NATURE'S ORTHOPEDIC APPLIANCE.

Nature, then, has already provided an almost never-ceasing orthopedic appliance which, under normal conditions, is efficacious far beyond human agencies, but in the perverted environment of our so-called civilization, conditions are ever favorable to abnormal or at least to unequal osseous structural development, and whether the etiologic factor be heredity, degeneracy, imperfect metabolism, or any other, for our purpose matters little, since any disarrangement of the character and conditions of this natural process of bone and muscu-

lar adjustment must result in an application of force in the wrong direction, and it is the effort to overcome malformations due to this agency under these conditions that gives rise to the necessity of resorting to appliances for the purpose of preventing, and oftentimes for the cure of, pathologic conditions which must inevitably result if correct treatment be not applied.

NASAL DISEASE DUE TO DEFORMITY.

Since it is admittedly true that a very large portion of the diseases of the nasal passages are due to malformation, or at least to imperfect development of the osseous and cartilaginous structures associated therewith, it necessarily follows that a rational procedure, whether in the nature of preventive or corrective treatment, should include an effort to overcome this predisposition to disease. It is therefore the application of force, both muscular and mechanical, that we have to consider at this time, although of course freely admitting the importance of other causes.

EFFECTS OF WIDENING THE DENTAL ARCH.

When pressure is applied by use of an appliance upon the lingual sides of the upper teeth, for the purpose of forcing them apart to widen the dental arch and palate, it must be expected that a considerable amount of the width thus secured will be due to a yielding of the alveolar processes. Yet it is only reasonable to suppose that, since complete union of the maxillary suture does not take place until middle life, until that period force exerted in this way must tend to a separation in a greater or less degree along this line.

Therefore, the natural result must be a widening of the nares, through expansion of the lateral bony walls, since whatever acts upon the nasal processes of the superior maxillary and separates them from each other by a wider intervening space must also make more or less alteration in those other bones which

are related to this portion of the maxillæ, and bring about, with unquestioned certainty, a greater diameter in measurement between the lateral walls of these passages. Separation of the maxillary bones also makes an alteration in the tension of the muscles from their points of attachment, hence an expansion and improvement in the cartilaginous portions of the nose. That these bones in young persons do separate under pressure is not only true by inference but is also known to be so by frequent example, since it is a common occurrence, when dentists are expanding the arch, for the central incisors to become separated to such an extent as to make it necessary to draw or hold them together with an appliance for the purpose.

IRREGULAR TEETH CAUSE MAXILLARY FORCE TO BE APPLIED IN A WRONG DIRECTION.

In older persons the change is more difficult to account for, but results have demonstrated so frequently in our dealing with such cases that immediate and practical results may thus be obtained that even a doubtful theoretical explanation seems warranted, in view of existing useful results. Personally, it seems clear to me that where teeth are interlocked with the upper teeth inside the lower, the force of the muscles of mastication applied against an inclined plane must cause a tendency to continued pressure in the wrong direction, which cannot fail to affect the structures in their immediate vicinity and also the higher and more distinct portions of the bone. In order to understand how this may be, one must comprehend the fact that during the entire life of every individual there is constantly taking place an alteration in the form of the dental arch and the shape of the teeth, in the relation of their approximal points of contact as well as of their morsal surfaces.

NATURAL CHANGES IN THE JAWS AND TEETH.

The alveolar process, which, at best, is only a transitory structure, is constantly undergoing absorptive and other changes during the cycle of its development and disappearance, from childhood to old age.

FORCE OF MASTICATION.

It has been demonstrated that the force applied by the muscles of mastication, when exerted to the utmost by the average adult individual, is equal approximately to a pressure of about two hundred pounds. In the crushing of ordinary food this force varies from twenty to seventy pounds, and under nervous excitement or in moments of subconsciousness due to abstraction, or to disturbances during sleep, it must be expected that for hours at a time a powerful lever is being applied constantly and repeatedly, exerting a pressure varying in forcefulness from sixty or seventy to at least one hundred and sixty pounds pressure. A moment's reflection must convince everyone that no bone in the entire human structure could withstand such action for any length of time without material alteration in form, either by absorption or other changes. This, then, is what must and does occur with the superior maxillary bones, causing, through them, compression or expansion of many lighter and more easily susceptible bones, those which by association complete the walls and dividing septum of the nasal passages.

Any factor which can cause contraction of the dense external plates of the superior maxillary bones, or prevent the widening process during their natural development, must result in the compression of the lighter, less resistant intervening structures, more particularly the turbinate bones and the vomer. Compression must invariably bring about abnormality of form, first in an effort of the yielding structures to adapt themselves to surrounding conditions by change in shape, and later by thickening

or unusual development caused by irritation due to pressure at points of contact, or loss of structure accounted for through absorption resulting from pressure.

At birth the lower jaw is larger than the upper, and both contain the germs of the deciduous teeth as well as those of the developing permanent teeth, with the single exception of the third molar. Expansion and development of the upper jaw is dependent upon development of the lower jaw and that constant pushing which exertion of the inferior maxillary induces. A very clear example of this is the person pictures of whom have been shown in Figs. 10 and 11. In this case it was impossible for the lower jaw to touch the upper, except at certain points, after three years of age, and it was noted that at the points where contact was possible the diameter across was about normal, but anteriorly there was almost no development whatever, since the arrest of development evidently resulted through a want of the chief enlarging factor—contact with the anterior portion of the inferior maxillary.

PATHOLOGIC SIGNIFICANCE OF DEVIATED NASAL SEPTA.

In this presence it would seem unnecessary to dwell at length upon the ill results that follow deviation of the nasal septum, or enlargement of the turbinated bones, and the formation of spurs which occlude the nasal passages, or the physical disasters due to mouth-breathing, adenoid vegetations, or hypertrophied conditions of the nasal and pharyngeal mucous membrane which such conditions favor, Eustachian closure and middle-ear affections that follow in natural sequence, or to expand upon a long train of other afflictions of the stomach and intestinal tract, neuralgias and kindred nervous disorders common among neurotics and sufferers from neurasthenia, or difficulties of speech due to insufficiency of room for the proper use of the tongue. The following case, reported by the patient's physiologist,

seems to be of special interest, and worthy of description for this reason:

"Case of Miss F. M. A young woman referred to me by Dr. Nelson M. Black came in charge of an attendant; almost or quite unfit to go about alone because of mental disturbance, notwithstanding the fact that a history of the case showed a month's treatment in a sanitarium for neurasthenia, without relief. There were present, according to the result of Dr. Black's examination, the following conditions:

"Miss —, aged thirty-three. Her family history was fair; there was a suspicion of specific history on the father's side, he having died of hemorrhage thirty years before. The mother died of uremia and was a morphin subject.

"Previous history: She was an only child; had scarlet fever at the age of five years, and her ears commenced to discharge two years later and continued discharging until two years ago. She had 'la grippe' one year previous to my seeing her. Had been a mouth-breather since she could remember, and when first seen was just convalescing from a severe attack of nervous prostration. She sought relief from deafness.

"On examination, her hearing was found to be *nil* in the left ear, but by bringing the lips almost in contact with the concha of the right ear she could hear the voice. Both the nares were occluded—the right by a deflection of the cartilaginous septum, almost at the external meatus; the left by a bony deflection farther posterior and by an arching of the floor of the naris on that side. In passing the probe over the floor of the left naris, I noticed that it did not pass back on a level but on an inclined plane, and then down toward the naso-pharynx. On examining the roof of the mouth the reason was evident, the left side of the palate being at least one-quarter inch higher than the right at the median line, forming almost a perfect step.

"Dr. G. V. I. Brown was called in to see the patient, and advised widening the lateral diameter of the upper jaw, which was completely within the

lower. This was done, and, to my surprise and delight, it was found that the stenosis of the nares was relieved to a considerable extent, and that a slight operation, after the manner of Asche, upon the deflected septum, straightened it out and gave her perfect breathing. Her speech, which, owing to the high V-shaped palatal arch, was very imperfect, changed remarkably after the removal of the apparatus for widening the jaw. Her hearing was somewhat improved by further treatment, for she could hear the voice, if a little louder than a conversational tone, at a distance of about two feet from the right ear.

"She was seen five months after the operation. In this time she had gained fifteen pounds, heard better, could breathe perfectly through her nose, and could talk very much plainer."

The improvement was due to the fact that the upper arch—which was so contracted as to allow the upper teeth to occlude inside instead of outside the inferior as in normal occlusion, with a high narrow palatal vault slightly higher on one side than the other—was expanded by the use of a small jack-screw appliance, until the upper teeth were spread apart so far that the buccal cusps of the upper molars and bicuspid, by reason of the fact that the form of the dental arch was now restored, met the lower teeth upon the outside of their corresponding cusps when the jaws were thus closed. A difference in width across the vault of the palate was thus secured equal to about six millimeters. It is almost invariably true in such cases that deflection of the nasal septum exists, and under such conditions hypertrophied conditions of the nasal mucous membrane—due to insufficient oxygenation owing to the narrowness of the passage and the difficulty in keeping it free from obstruction to the air during inhalation and exhalation—are made still worse by spurs undoubtedly favored by low inflammatory processes which are

invariably the accompaniment of this condition.

The significance of these facts to us at this time is that the duty rests upon us as individuals having special interest in all affections directly related to pathologic nasal and oral conditions, to recognize the fact that an ever-growing tendency to crowded teeth, contracted dental arches, mouth-breathing, and insufficient facial development, from which the children between the ages of eight and sixteen years are suffering, must receive attention; also that, as a prophylactic measure, those elements and forces for the lack of which growth is arrested must be supplied by appliances to expand, and by this means gain an increase in size and an improvement in character in all bones the arrested development of which means a contraction of the nasal passages.

Since individual effort in the direction of bringing the attention of parents to the gravity of ill results due to neglect must necessarily be more or less limited, boards of education and others able to control a more widespread influence should be given the opportunity to learn that a very large percentage of all children might be permanently benefited by the avoidance of future possibility of ill health, if such care as has been outlined above were to be given them; and in addition all might to advantage bear in mind the fact that in the treatment of adults also very material assistance may thus be derived.

In closing, I suggest that this society can undertake no better work, nor one more fitted to forward the purposes of this organization, than that of urging, through every possible avenue, the examination of the mouths of school children by competent oral surgeons and dentists. The direction of thought given by this paper develops only one of the many considerations of vital importance pertaining to public and general, as well as individual, health that would thus be conserved.

THE SEALED GOLD INLAY.

By Mr. W. FRANCIS MELLERSH, Surbiton, London, S. W., Eng.

THAT there is a desire to eliminate the element of drudgery inseparable from the making of large gold fillings in the ordinary way is evidenced by the place given the subject of inlays other than those of porcelain in modern dental literature.

Various methods of making such have been described, one of the most common being a plug of scrap gold and solder cemented in place.

Such, however, have appeared to me unsatisfactory, and for some time past I have experimented with a view to the construction of a gold filling which, made as an inlay, fixed *in situ* would give the same results and seal the cavity margins as effectually as a properly condensed filling of cohesive or non-cohesive foil.

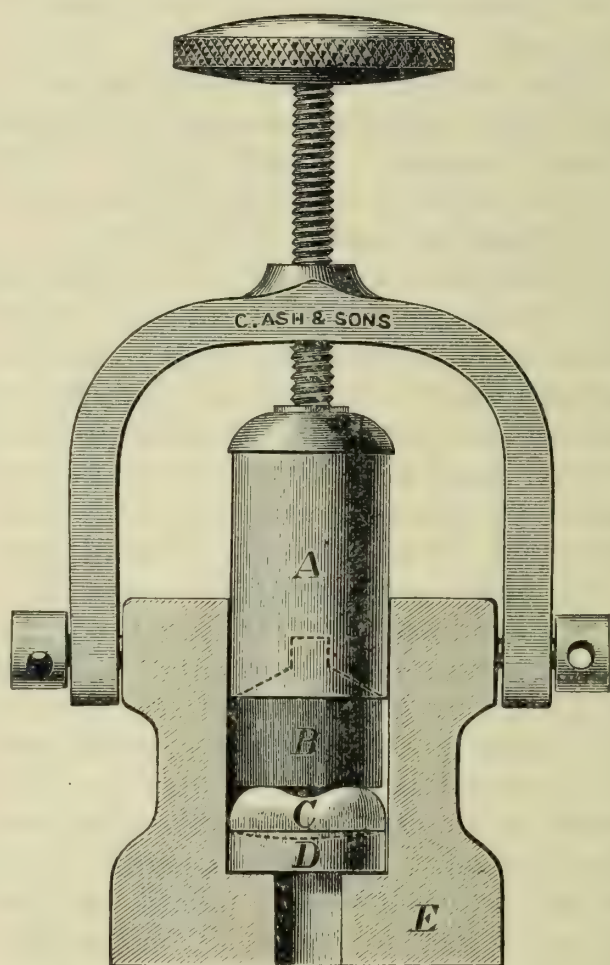
Any process which will save the operator's time, and enable him to produce fillings without malleting, the bulk of the work being done away from the consulting room by a mechanical assistant, must be of interest and importance; and by no means the least important point to be considered is that both the patient and operator are subjected to less physical and nervous strain.

The problem of making such a filling for a certain class of cavity is solved with the filling I am about to describe; this, however, has, like most other methods, limitations. It can only be employed for cavities having margins easy of access, and will be found most useful for crown and buccal cavities in molars and crown cavities in the bicuspids.

Messrs. Claudius Ash & Sons, Ltd., in 1899 introduced a combined inlay and crown swager. (Fig. 1.) This has been used extensively in England since that time for crown work, with the water-bag

suggested by Mr. J. H. Badcock for Ash & Sons' system of porcelain inlays. By the aid of this apparatus the gold plug is constructed.

FIG. 1.



A. Plunger. B. India-rubber water-bag. C, D. Plaster of Paris mold and bedplate. E. Section of base with hole in floor for dislodging bedplate after plunger is removed.

After opening up the cavity freely with chisels and fissure burs, the decalcified dentin is removed—if deep—the floor is covered with a thin layer of Fletcher's artificial dentin, and all undercuts filled with a quick-setting cement; the walls are left nearly parallel by means of a specially made right angle fissure-shaped finishing bur. The cavity

is painted with vaselin and an impression taken with "dental lac," conveyed in a tray of the shape illustrated. (Fig. 2.)

This, after cooling in water, is cast on to the swager bedplate in plaster mixed with alum water; the model being hard, the impression material is heated gently in a Bunsen burner and removed. The cavity is now lined with thin platinum foil, the water-bag making this a very simple matter. (Fig. 3.) Should the foil tear, swage a small piece to cover the defective portion. The bedplate, with the attached model, is removed from the swager, transferred to a soldering block, and the foil-lined cavity filled with gold, 24 karats fine, fused under a blowpipe. The most convenient form for this gold is pin-wire size cut in short lengths. When sufficiently full the surface should be slightly concave.

On removal from the investment the superfluous foil is trimmed away with scissors, the plug grasped in a pair of fine roughing pliers, and the surface thereof smoothed with a plate file; the pliers should be used to draw the plug across the surface of the file. It is desirable before cementing in place to try the plug in the cavity in order that the surface may be left a shade lower than the surface of the finished filling should be.

A deep retaining groove is cut around the plug with a fret saw of the thickness used for cutting vulcanite, and, if the plug is sufficiently thick, this groove may advantageously be widened with a fine file. The rubber dam being on, the cavity walls are undercut with an inverted cone bur, and the plug fixed with cement of a creamy consistence, and the whole varnished.

At a subsequent visit the rubber dam is applied, the edges sealed, and the filling rapidly finished.

A large pear-shaped finishing bur is passed over the whole surface of the plug, which is thereby left absolutely clean. With a small finishing bur of the same shape a groove is cut over the line of cement at the junction of the gold and tooth-substance, as shown in Fig. 4. It

is not necessary or desirable that this should be given a retentive form. A piece of De Trey's No. 2 Solila gold, of

FIG. 2.



FIG. 3.

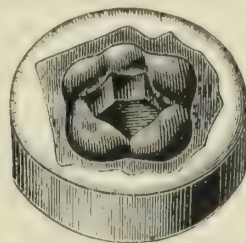


FIG. 4.

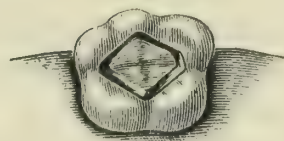


FIG. 5.

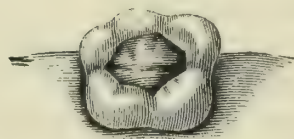


FIG. 6.



FIG. 7.

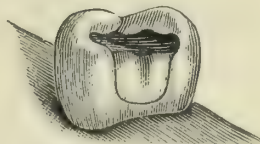
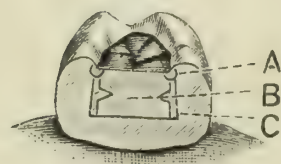


FIG. 8.



Sealed inlay on section. A, sealed edges of cavity. B, gold plug. C, intervening cement.

a size to cover the whole plug, is annealed, placed thereon, and rapidly condensed with the hand-pressure instruments made for this gold. A few narrow strips are sufficient to fill the grooves cut

by the small bur, so that but a short time after the dam is applied the filling may be finished as here shown. (Fig. 5.)

Compound fillings, such as illustrated in Figs. 6 and 7, can be made by proceeding as already described up to the lining of the cavity. When the foil is in place the desired contour is built out with wax; over the buccal or lingual aspect of the wax surface another piece of platinum foil is burnished, the whole invested in sand and plaster, and the wax boiled out; thus a foil-lined cavity with four walls is disclosed into which pure gold can be fused.

In comparing this method with the usual one of condensing gold these points should be noted:

The same amount of time suffices for cavity preparation.

The lac impression-taking occupies but a minute.

The plug is made in the laboratory by an assistant.

Whilst this is in progress the patient may return to the waiting-room and the

operator see other cases. In a busy practice such subdivision of time is often convenient.

The plug being made, and retaining grooves cut, the application of rubber dam and fixing and varnishing the plug occupies but a few minutes. Thus the bulk of an extensive filling may be made without fatigue to patient or operator.

No other method will produce a more solid filling; the edges are perfectly sealed, as evidenced by Mr. Douglas Gabell of London, he having subjected such fillings to tests for leakage, and microscopical examination of sections cut failed to show any penetration.

Fig. 8 shows a sealed inlay on section.

To the best of my belief this method of sealing metal inlays has not been described before.

Note.—I am indebted to Mr. Howard Wordsworth for drawings illustrating my method, and to Messrs. Claudius Ash & Sons, Ltd., for the illustration of their swaging apparatus.

A CASE OF GUNSHOT WOUND OF THE INFERIOR MAXILLA.

Reported by JOHN S. MARSHALL, M.D.,

PRESIDENT OF THE BOARD OF EXAMINING AND SUPERVISING DENTAL SURGEONS, U. S. A.

HISTORY: C. R., a native of the Philippine Islands, seventeen years of age, servant of an officer of the Third U. S. Cavalry, was brought into the U. S. A. General Hospital, Presidio of San Francisco, May 31, 1902, at 3 P.M., with a gunshot wound of the face, tongue, and inferior maxilla. Hemorrhage from the wound and mouth was considerable. The wound was caused by the accidental discharge of a service revolver, 38 caliber, in the hands of another Filipino boy while he was in the act of cleaning the weapon. The wounded boy was sitting upon the floor of the tent, the other was standing near the

opening of the tent and upon the left side of the injured boy, when the revolver was discharged. Family history not obtainable. States that he has never been ill.

EXAMINATION: The examination revealed the wound of entrance to be upon the left side of the face, about one inch posterior to the angle of the mouth and about a half-inch above the lower border of the jaw. The direction taken by the bullet was slightly downward and backward, passing through the left side of the jaw, comminuting the bone, the first and second bicuspids, and the first molar teeth, passing through the tongue and right submaxillary gland, colliding with

the lower border of the jaw upon the right side, at the angle, cutting out a semilunar section but not causing a complete fracture, and emerging upon the right side of the face, just beneath the angle of the jaw. Hemorrhage was quite severe.

Bleeding was controlled by packing the wounds with gauze and applying cracked ice to the mouth. Dressings were applied and maintained in position by an occipito-mental bandage. Temperature 97° F., pulse 110. Patient complained of severe pain in the jaw and tongue, which was controlled by hypodermic injections of morphin sulfate gr. $\frac{1}{4}$, atropin gr. 1/100. At 10 P.M. half of this dose was repeated. Vomited at 6 P.M. a quantity of undigested food. Slept fairly well until 2 A.M.; quiet from that time but did not sleep.

June 1st, 8 A.M. Packing removed and wounds irrigated with bichlorid solution 1:1000 and redressed. Temperature normal, pulse 99. Packing was very offensive; tongue much swollen.

12.30 P.M. Wounds irrigated and redressed. Temperature 100 F., pulse 90.

9.30 P.M. Hypodermic injection morphin sulfate gr. $\frac{1}{8}$, atropin gr. 1/100.

1 A.M. Wounds irrigated and redressed.

June 2d. Wounds irrigated and dressed. Discharge considerable; tongue badly swollen. External splint applied to jaw.

3d. Wounds irrigated and dressed. External splint reapplied.

4th to 7th. Same treatment, and mouth-wash of listerine and hydrogen dioxid equal parts, to keep the mouth clean.

On the 7th I was invited to see this patient, as the ward surgeon was unable to adjust the fractured parts of the jaw and maintain them in a normal position. Upon examination it was found that the left side of the jaw was badly comminuted and a considerable portion carried away, and the posterior fragment of the jaw was carried upward and inward by the action of the temporal and internal pterygoid muscles, while the anterior fragment was carried downward

and backward by the action of the platysma myoides, digastric, genio-hyoglossus and genio-hyoid muscles, causing it to override the posterior fragment externally. Swelling of the tongue and of the jaw upon both sides was so great that no attempt was made to reduce the fracture. The parts were freely movable. Treatment continued as before.

19th. Swelling and suppuration much less.

20th. X-ray picture taken of the jaw, which showed the loss of bone structure to be considerable; swelling and suppuration still continuing.

21st. Impressions of the upper and lower jaws taken in plaster of Paris, from which to construct a Gunning or Hayward vulcanite interdental splint.

25th. Swelling and discharge much less. The interdental splint was adjusted and the jaws bound together with a four-tailed bandage. The splint was constructed to cover all of the lower teeth, but only the bicuspid and molars of the upper jaw. An opening was made in the left side of the splint, where the lower teeth were lost, for the purpose of feeding.

Considerable difficulty was experienced in adjusting the fractured ends of the jaw, on account of adhesions, but these were broken up under an anesthetic. Diet, liquid food.

26th. Patient displaced the bandages during the night, which allowed the lower jaw to slip from the splint and fall back into the old position.

Fracture again reduced and four-tailed bandage reapplied.

27th. Bandages and splint again displaced during the night. After the treatment of the wounds which were still open and discharging both externally and into the mouth, the barber was called and ordered to shave all the hair from the patient's head. After this was accomplished the fracture was again reduced, the splint adjusted, and the jaws firmly closed upon the splint by the aid of pressure beneath the jaw, applied by the hand of an assistant. Strips of surgeon's adhesive plaster, three-fourths of an inch wide and long enough to pass under the

jaw and over the crown of the head were then applied with as much tension as possible, with the fingers. These strips, three in number, passed over the cheeks in front of the ears and lapped over each other from two to three inches, upon the crown of the head. By this method the jaw was held securely in its correct position, and by no effort of the muscles was the patient able to dislodge the splint.

July 7th. Abscess, in right side of neck just beneath the angle of the jaw, has formed. It was opened under cocaine anesthesia, and several small pieces of bone and tooth-structure removed.

12th. Wounds still discharging pus. Pus from right side mixed with saliva. Salivary fistula feared.

13th. Opening between the abscess cavity and the mouth closed, as fluids no longer enter the mouth when irrigating the wounds.

15th. Small piece of bone removed from the wound on right side.

18th. Small piece of the bullet removed from the wound on right side.

20th. Wounds look much better; discharge much less. Saliva still mixed with the pus.

22d. Wounds slowly granulating.

26th. The wound into the mouth has reopened, but the discharge is less.

27th. Splint removed for observation of the process of repair in the fracture, thirty days after the last adjustment. Fracture found to be fairly well united, and the occlusion of the remaining teeth perfect. Muscles of the jaw slightly stiff from non-use.

The patient had increased in weight, from 82½ pounds on the 16th of June to 85½ pounds on July 27th, although he was living upon a liquid diet during all this time.

The interdental splint was readjusted and the position of the jaws maintained by the adhesive strips applied as before.

30th. Abscess at right side of the jaw still discharging. Cervical glands of right side red and swollen.

August 3d. Cervical glands incised. Much pus discharged; small piece of bullet removed. Wound dressed with iodoform gauze.

7th. Interdental splint removed. Fracture firmly united, occlusion of the remaining teeth perfect. Further use of the splint not necessary. Wounds in the jaw and cervical abscess still suppurating. Diet changed to solid food.

10th. Small piece of bone removed from left side of the jaw.

21st. Wound in right side of the jaw still discharging pus and saliva. Cauterized sinus with silver nitrate. Large swelling on the left side of the jaw in location of fracture.

22d. Abscess in left side of the jaw incised. Considerable pus discharged. Packed with iodoform gauze.

25th. Sinus in right side of the jaw still opens into the mouth. Very little discharge of saliva. Cauterized with silver nitrate. Abscess in left side of the jaw rapidly healing; small amount of pus discharged.

26th. Piece of bullet removed from abscess in right side of the jaw.

28th. Sinus in right side of the jaw still opens into the mouth, but external discharge of saliva has ceased. Cauterized with silver nitrate. Cervical abscess in right side discharging very little pus.

September 2d. Sinus in right side of the jaw very small. Still opens into the mouth, but there is no external discharge of saliva. Abscess in left side of the jaw nearly healed.

5th. Both abscesses nearly healed. Sinus in right side of the jaw very small. Still opens into the mouth, but there is no external discharge of saliva. Cauterized with silver nitrate.

8th. Patient weighs 93½ pounds.

10th. Abscess in left side of the jaw reopened, irrigated, and packed with iodoform gauze.

11th. Abscess in left side of the jaw irrigated with hydrogen dioxid, and repacked with iodoform gauze.

14th. Sinus in right side of the jaw closed. Abscess in right side of the neck healed. Abscess in left side of the jaw nearly healed.

15th. Abscess in left side of the jaw apparently healed. Physical condition fine. Weight 93½ pounds. The boy was

discharged at this date as cured, and sent by request of his master to Montana.

SPECIAL FEATURES OF THE CASE.

There are several interesting features in the history of this case, viz:

First. The bullet, in its course through the face, comminuted the left side of the jaw and the first and second bicuspids and the first molar teeth, carrying the fragments before it into the tongue and the right side of the neck, where they afterward produced abscesses.

Second. The bullet was one of the soft-nosed variety, and in its passage through the bone was more or less deformed and split up, as was evidenced by the fact that several pieces were afterward discharged from the wounds and the abscesses which formed in the jaw and neck in the later history of the case.

Third. Although the bullet came in contact with the jaw of the right side, cutting out a semilunar notch from the lower border and body of the jaw, it did not produce a complete fracture in this region. This, I am inclined to think, was due to the short range and high velocity of the missile, as it passed through the bone. Had the range been longer and the velocity diminished, the damage to the bone would have been in all probability much greater.

Fourth. The loss of bone tissue from the left side of the jaw was very considerable, and I feared the gap was too great to be filled in with new bone, and that an ununited fracture or a false joint would be the result. With this fear in view, the construction of the Gunning or Hayward splint was decided upon, as it would best hold the ends of the fractured jaw in their proper relations and secure absolute immobility. The application of the four-tailed bandage is the usual means employed to maintain the proper occlusion of the teeth within the splint, but in this case it proved a signal failure. I therefore adopted the method of shaving the head and binding the jaws together with the strips of adhesive plaster. This prevented the patient from moving the jaws in the slightest degree and secured the immobility of the fracture which was in

this case so desirable. This method of shaving the head and binding the jaws together is not new with me, as I have employed it in several cases, in civil practice, before I entered the service.

Fifth. The bullet in its passage through the floor of the mouth passed through the right submaxillary gland, and it seemed at one time in the history of the case as if it would be difficult to prevent the establishment of a salivary fistula beneath the jaw. During the healing of the wounds the patient was cautioned to lie upon the left side when in bed, that gravity might carry the secretion of the gland into the oral cavity, through the sinus which still remained open into the mouth beneath the tongue. Every effort was of course made to keep the oral opening of this sinus patulous, so as to favor the discharge of the salivary secretions into the mouth; while the external opening was stimulated with silver nitrate to promote more rapid granulation and healing, with the result that a salivary fistula was prevented.

Sixth. Although the splint was worn continuously for forty-one days—thirty days without removal, and again eleven days without removal—the only effect upon the temporo-maxillary articulation from this long immobility was a slight stiffness of the muscles and ligaments, while this stiffness entirely passed away after a few days of use.

Seventh. The reproduction of so large a section of bone in the inferior maxilla following such an injury is by far the most remarkable feature in the case. Reproductions of extensive portions of bone in the inferior maxilla following necrosis have been reported from time to time, but I do not remember to have read of a case of such extensive loss of tissue from a gunshot injury or a surgical operation in which the bone was reproduced and the jaw restored to its normal condition; which goes to show that Nature, under the favorable conditions of youth, health, and a little intelligent assistance upon the part of the surgeon, will sometimes produce results that seem, to our limited understanding of her resources, next to marvelous.

A RÉSUMÉ ON ROOTS AND THEIR TREATMENT.

By **Mr. S. J. FERNANDEZ**, Sydney, N. S. W., Australia,
ASSISTANT SURGEON TO DR. A. G. KNIGHT, SYDNEY, N. S. W., AUSTRALIA.

SUCH workers as Downie, Evans, and others have so improved crown and bridge work nowadays that roots and their treatment are becoming more and more important, and will continue to be so until the slow educating of the public as regards their teeth will disclose to them the necessity of visiting a dentist regularly, thereby saving themselves and the operators the unpleasant task of dealing with decayed roots. However, great strides have been made in overcoming the difficulties of what a few years ago would have been considered hopeless cases. In fact, as long as the diagnosis shows that the root or roots are not hopelessly abscessed, or show no signs of severe periodontitis, something may be done in most cases in a therapeutic direction. In this paper I propose to endeavor to present this subject in its latest forms and methods, drawn from various sources, with no pretensions of originality, but with the idea of presenting a revision for the benefit of students, who may find the variety of the articles written on the subject somewhat confusing.

Starting from this varied and much-discussed subject, we propose to recognize the following three states, omitting abscess complications and periodontitis, which we propose to deal with under a separate heading:

(1) Pulps which have been devitalized.

(2) Pulps which are in a putrescent state and non-sensitive.

(3) Pulps in which are found filaments still living and sensitive.

We will now consider—

(1) PULPS WHICH HAVE BEEN DEVITALIZED.

1. Apply the rubber dam.
2. Obtain free access to the pulp-cavity.
3. Dry, and apply an antiseptic, preferably a non-coagulant.
4. Remove as much as possible of the dead pulp, picking out débris carefully without forcing any particles through the apex.
5. Dry, and apply an antiseptic.
6. Remove rest of pulp-filaments by a cleansing agent, *e.g.* sodium dioxid, etc. Fill, taking care that the root has been thoroughly dried and that a non-irritant and antiseptic filling material closes the apex, *e.g.* iodoform paste—formed thus: Eugenol or eucalyptus, zinc oxid, and iodoform. Aristol and cassia, carried on non-absorbent cotton wool, pressed up with a shaped wooden toothpick soaked in cassia (rendering it elastic) may be used to very good advantage.

In these cases almost any filling material may be used, except when discoloration is to be considered in anterior teeth, that is, when the natural crown is to be preserved. In that case the use of liquefied salol or gutta-percha is advised. If there should only be a root to be used for a crown or abutment the base should be thoroughly coated with silver nitrate. Should cement or gutta-percha be used to insert a pin or support a crown, in the first-mentioned case plug the apex with iodoform and eucalyptus, and in the latter case with iodoform and eugenol, being careful that the plug in both cases is as minute as possible, and that it gets to its destination.

(2) PULPS WHICH ARE IN A PUTRESCENT STATE AND NON-SENSITIVE.

Diagnostic. An application of pyrozone three per cent., which will by a bubbling process detect the presence of pus.

A putrescent pulp remaining in the root-canal gives rise to the formation of sulfureted and phosphoreted hydrogen gas from the disintegrating tissue, which, when the septic matter is forced through the apex, causes irritation and subsequent abscess of the surrounding tissue. The presence of these suppurative gases warns us to be very careful to destroy them before closing the pulp-cavity, and in destroying we must on no account force them through the apex. After adjusting the rubber dam our object will be to free them, taking a small particle of sodium dioxid or a minute globule of sulfuric acid on a platinum point or platinum drop-tube. Apply carefully, making two or three applications in preference to causing a violent explosion by applying too much at once, of course alternately drying and applying sodium bicarbonate in the sulfuric process; picking out débris as you proceed, with greatest care when nearing the apex. When sure that you have removed everything, dry thoroughly, and vaporize an antiseptic—formalin twenty per cent., or 1:10,000 sublimate solution. Then take a small filament of cotton wool saturated in iodoform and eugenol, adjust loosely in the canal, sealing lightly with Hill's gutta-percha stopping, or cotton and varnish. Apply aconite and iodine in equal parts to both sides of the root, instruct the patient to remove temporary stopping if irritation supervenes, and dismiss him for a few days. On the return of the patient if pyrozone gives no indication of pus, fill as advised in the first section.

(3) PULPS IN WHICH ARE FOUND FILAMENTS STILL LIVING AND SENSITIVE.

When a pulp is too sensitive to permit of immediate extirpation, the usual course is to apply an arsenical prepara-

tion. But how can the pulp absorb the devitalizer when the bloodvessels are inactive and semi-dead, yet upon inserting a nerve broach in the canal the filaments are found to be still sensitive?

A successful method of treatment is as follows: After adjusting the rubber dam, where permissible remove as much of the filaments as possible, using cocaine or some other obtundent. When the canal has been thoroughly dried, apply a tanning agent, alum paste (Söderberg's), or tannic acid and glycerin, on non-absorbent cotton wool, and lightly sealed in the canal. A few days afterward the filaments may be painlessly removed, after which proceed to fill the root as described in the first part of this paper.

TREATMENT OF ABSCESSED ROOTS

When pyogenic bacteria penetrate through the apical foramen and set up inflammation, alveolar abscess is the result. The prognosis of alveolar abscess is particularly marked, the pain attending it being deep-seated and throbbing.

Abscesses are divided into two classes: acute and chronic. (1) The *acute* abscess, having no exit for the pus, is usually met with in a very severe form, with rapid inflammation of the surrounding tissues. (2) The *chronic* form is caused by the inflammation remaining and entering into a permanent form, and sometimes establishing a sinus through the alveolar process for the pus to escape. It is particularly the chronic form that requires careful treatment, and it will not yield to treatment as readily as will the acute form.

Treatment. The therapeutic treatment consists of first removing all irritating bodies from the pulp-cavity, which should be freely opened to the apex of the canal or canals, and the application of antiseptic remedies—hydrogen dioxid, injected slowly into the canal, may be used to advantage—followed by such agents as will cause the destruction of the sac, viz, zinc chlorid, etc., or usually the sulfuric acid process. Where a sinus has been established it should be enlarged with a sharp-pointed

bistoury, and zinc chlorid injected through the canal and sinus, its contact with the mucous membrane being prevented by the use of napkins, cotton wool, etc. Now dry the canal and vaporize an antiseptic—formalin 20 per cent. or 1:10,000 sublimate solution—and after thoroughly drying, fill the canal loosely with cotton wool saturated with iodoform and eugenol, sealing lightly with gutta-percha stopping. Apply aconite or iodine in equal parts to both sides of the root. Instruct the patient to remove the temporary stopping if irritation supervenes and discharge the patient for a few days. On the next visit, if on the application of pyrozone no pus is found to be present, fill with gutta-percha, taking the usual precautions to thoroughly dry the root, and close the apex with a non-irritant and antiseptic filling material.

PERIODONTITIS.

Independent of alveolar abscess—although usually a premonitory stage of it, as it rarely occurs before the pulp has lost its vitality—is the condition known as periodontitis or pericementitis, which denotes inflammation of the peridental membrane surrounding the roots of the teeth.

Diagnostic. Tenderness and inability to comfortably masticate food, but unaccompanied with violent pain as in alveolar abscess.

There are two forms of periodontitis, the acute and chronic.

The *acute* form is generally due to direct local irritation, and is readily diagnosed by the pain caused when pressure is applied to the affected tooth. The symptoms of the acute variety are a slight sensation of uneasiness and tension and a feeling of fulness about the affected part, with a desire to press the teeth together.

The *chronic* form is a modified form of the acute, and the symptoms are soon followed by a dull, heavy, and continuous pain; occlusion of the teeth gives rise to severe pain, and there is an inclination to keep the jaws apart. At this stage other teeth may become affected, and the appearance of the gum surrounding the root of the affected tooth assumes a deep purple color.

In pulpless teeth, the peridental membrane is very susceptible to inflammation, owing to the weakened condition of this membrane, and even during the process of devitalizing inflammation is sometimes set up.

For the treatment and filling of the roots in this form of periodontitis, see class (1) in the first part of this paper. While pursuing the treatment great care should be exercised by applying soothing applications to the mucous membrane—iodine, aconite, etc.—and in seeing that the root is reduced beyond the line of occlusion. Relief will be found to speedily follow on removing the cause. The following are a few of the numerous causes: Putrescent pulp, defective occlusion, salivary calculus, loose teeth, and mechanical irritation.

DENTORED DENTURES.

By W. STORER HOW, D.D.S., Philadelphia, Pa.

AT the meeting of the National Dental Association, in Asheville, N. C., July 25 to 31, 1903, there was reported from Section I, and read by its author, Dr. N. C. Leonard of Nashville, Tenn., a paper on "Adhesion *vs.* Atmospheric Pressure in the Retention of Dentures."

Dr. Leonard sought to distinguish between denture retention due to the capillary attraction induced by the film of fluid between the mucous membrane and the base plate or denture, and retention due to partial air exclusion and consequent pressure of the atmosphere on the plate or denture, especially when vacuum chambers are employed. Hydrostatic and pneumatic principles in their several and joint relations to the subject were set forth by the author, and cited in more or less detail by the several participants in the ensuing discussion, which, in the main, might be deemed contrary to Dr. Leonard's contention that to hydrostatic pressure is in great part due the denture adhesion usually ascribed wholly to atmospheric pressure.

The lack of a convenient blackboard discouraged the "chalk-talk" considerations at that time in the mind of the present writer, who now recurs to his article in the DENTAL COSMOS for July 1895, and briefly cited in the "American Text-Book of Prosthetic Dentistry," at pages 582, 583, as suggestive of a further elucidation of Dr. Leonard's subject.

The following premises are pertinent at the outset: In the oral region of the patient with which we are concerned we have as a base of operation the completely or partially edentulous hard and rigid upper or lower jaw bone. Each has a superposed cloak of smooth, soft vascular tissue constantly covered with

mucus, a viscid fluid which gives rise to the designating term "mucous membrane." The problem is to make a hard and rigid base plate closely conform to the moist, soft, smooth irregular surface of that living, sensitive mucous membrane, and carry securely for purposes of mastication and speech an artificial denture. The proceedings in the production of a denture for a given case will be modified by its peculiar requirements, and the competency of the dentist. All will depend upon the close contact of the plate with the mucous membrane which it covers, and, for present purposes, attention will be restricted to base-plate contact and detention, without specific reference to the superposed denture.

Fig. 1 represents at A a plaster model of an edentulous upper jaw to which a vulcanite, celluloid, or cast-metal plate is to be conformed.

With a spoon excavator, say No. 186, and following a carefully penciled line along the buccal and labial borders of the muscle attachments, a shallow groove or channel (C, Fig. 1) is smoothly cut and continued across the palatal arch as shown, the outline being uninterrupted. A supplemental channel (C¹) may then be likewise cut.

A resultant denture and plate (B), with the raised half-round dentors D, D¹, would appear as in Fig. 2. In Fig. 3 a partial plate and denture is shown as made in like manner, but the illustration will also represent a struck gold plate on which, after a perfect annealed adaptation, a link of No. 22 platinum wire, as D², is soldered to the plate. The denture B, Fig. 2, may also be viewed as consisting of a wire dentored metal plate on which gum-section teeth are mounted in vulcanite. A set of plain teeth with pink vulcanite gum mounting

on such a gold plate would likewise resemble the denture B, Fig. 2.

These illustrations and brief descriptions prepare the way for the further consideration of the principles and practicalities involved in this species of prosthetic products. Whether the denture has a vulcanite, celluloid, cast-metal, or

FIG. 1.

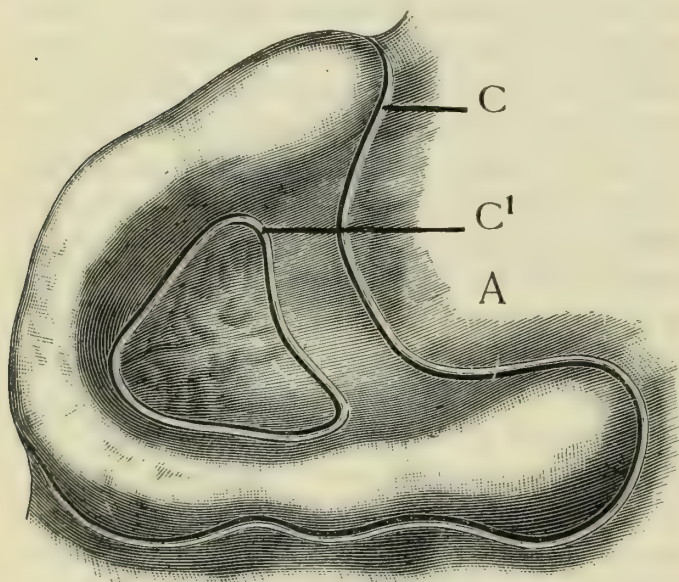
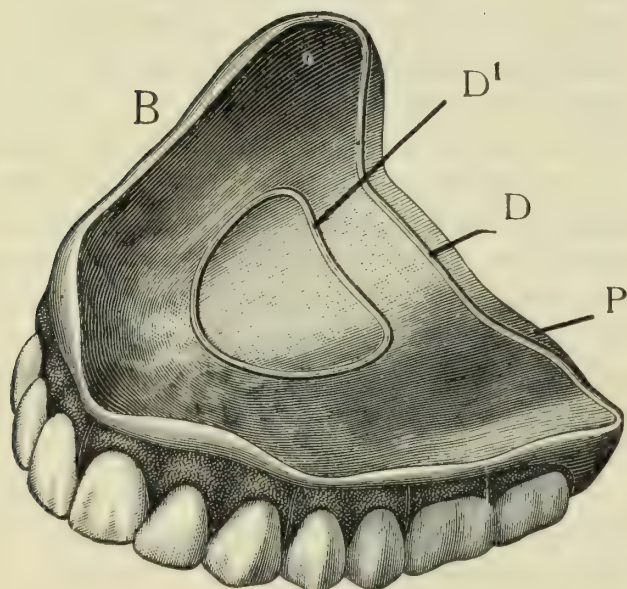


FIG. 2.



struck-metal base plate, the conditions under immediate contemplation are—

(1) An edentulous human upper or lower jaw.

(2) A partially edentulous upper or lower jaw.

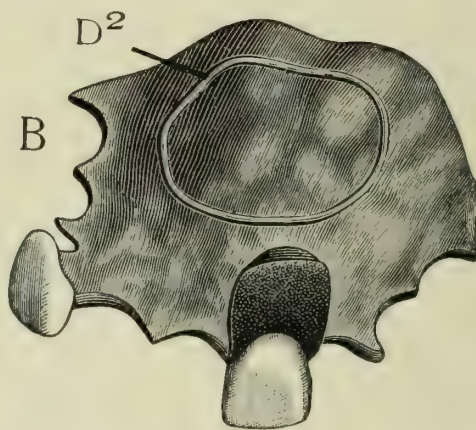
(3) Its soft smooth mucous membrane.

(4) The viscid mucus (and saliva) covering its membrane.

(5) A rigid artificial plate closely conformed to a regional portion of that mucus-moistened membrane.

(6) In any given case it is understood that the smooth plate at rest in position on the upper or lower jaw is in accurate coaptive conformation to the included surface of the mucous membrane. Fig. 4 represents in medial vertical section, magnified, the oral region of an edentulous upper jaw (UJ), its rugæ (R), mucous membrane (M), mucus film (*m*), and the dentees (*d*, *d*¹, *d*², *d*³) made in the membrane by the dentors (D, D¹, D², D³) of the plate P. In all the following descrip-

FIG. 3.



tive matter the plate will be designated by the letter P, and the denture of whatever superposed sort, by the letter B. The new term *dentor* describes a complete or partial low-relief inclosure formed or fixed on the contact surface of a denture plate; and to the corresponding depression made by the dentor in the mucous membrane is given the new term, *dentee*. When the denture Fig. 2 is in position and pushed into place by occlusion or otherwise, exhaustion of air from the oral cavity by the act of swallowing will develop—

(7) Atmospheric pressure (a. p.) on the exposed surface of the denture plates B, P, Figs. 2 and 4, consequently the denture will be maintained at rest in resistance to gravitation.

(8) When by incisive action of the lower denture (see Fig. 4) an outward and upward pressure in the direction of the upper arrow ensues, the resultant stress tends to detach the plate by start-

ing it from its palatal border (N), which has an extent approximately indicated by the transverse vertical section view, Fig. 5, from N to N.

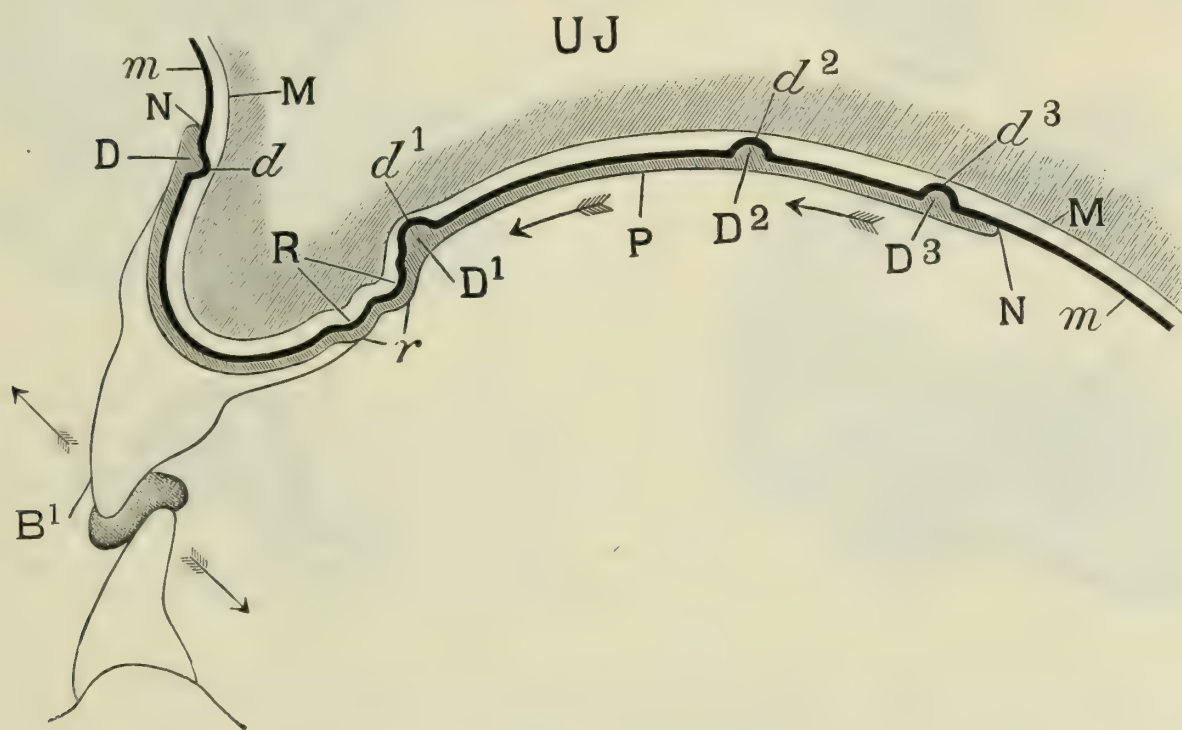
(9) The mucus (m , Figs. 4 and 5) is a *viscous* fluid, exerting a considerable amount of seated superficial *energy* in contact with the membrane (M) and the plate (P).

(10) Hence the *flow* of that film of energized viscous mucus between M and P in resistance to air inflow at N will be slow; and then, besides, there is—

B^1 , where, at the same disadvantage, the energy (9), flow (10), and friction (11) of the mucus m is to be vanquished at N *after* (7) has been neutralized so far as to let a. p. (7) begin to drive m under N against D^3 , d^3 (12).

(13) The time element then becomes a detentive factor additional to viscosity, energy, flow, friction, and dentor-denteesion, as m is pushed by air-film pressure in the direction of the arrows against, over, and past D^2 , d^2 , D^1 , and R, r , until at D, d , the plate and denture

FIG. 4.



(11) The *friction* of the mucus flow to be overcome.

(12) Moreover, the restriction of flow and friction by mucous membrane condensation between the dentor D^3 and the dentee d^3 , is a detentive factor additional to the retentive factors (9), (10), and (11). A philosophical disquisition on the physical principles and functions here involved would be appropriate, but the present purpose is simply to direct attention to the actual conditions to be met in practice, and to provide practical means for success in meeting and overcoming them. It is thus made obvious that resistance to the detaching stress of (8) is active in the leverage exerted by (7) at the transverse palatal curved border N of P, Fig. 4, as opposed to the one-fourth less leverage of the push at

become finally detached. We see, therefore, that in addition to atmospheric pressure (7), we have the inherent, coherent, adherent, attractive, resistive, and detentive potencies of (9), (10), (11), (12), and (13), to be made cooperative in a resultant leverage-resistance to denture displacement. The behavior of the enumerated factors is furthermore made manifest by observations on Fig. 5. Lateral masticatory action in the direction of either arrow should fail to detach the denture for the reasons previously set forth. Jaw-separative action, following occlusive contact with a caramel, for example, should also fail to pull down the denture because of the auxiliary detentiveness of D, d , Figs. 4 and 5.

Lower-jaw dentures, complete or par-

tial, are subject to the like conditions and correlations as are dentures of the upper jaw, but in less degree, under more difficult, delicate, and modifying requirements, as having narrower, less crested bases, and thinner mucous membrane; being subject to constant gravi-

quant (8), (9), (10), and (11) factors, reinforced by D , d , and D^4 , d^4 , on the opposite body of the jaw; the resultant resistance to displacement being (7), (14) plus (8), (9), (10), (11), (12), plus—

(15) The upward masticatory force.

FIG. 5.

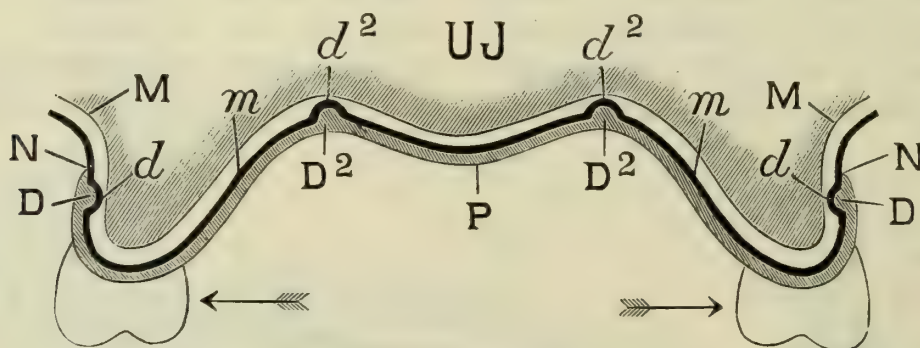


FIG. 6.

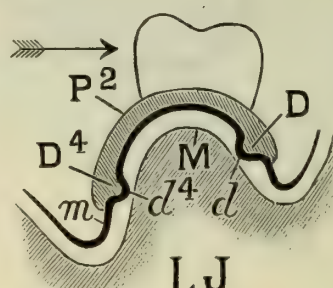
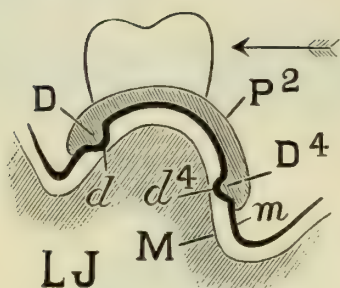
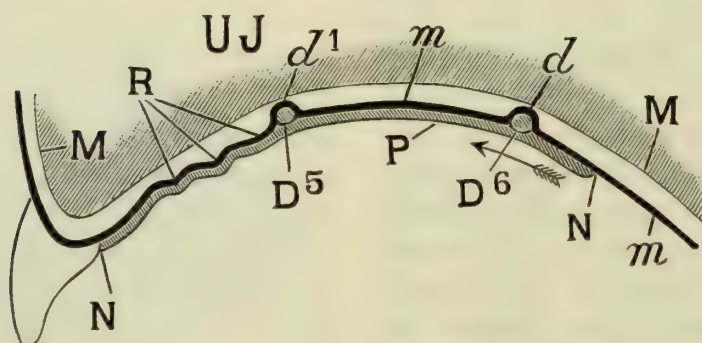


FIG. 7.



tational pressure, and also dilutions of the mucus by the abundant, less viscid, saliva. Fig. 6 is a transverse vertical section across the second molar region of a lower full denture.

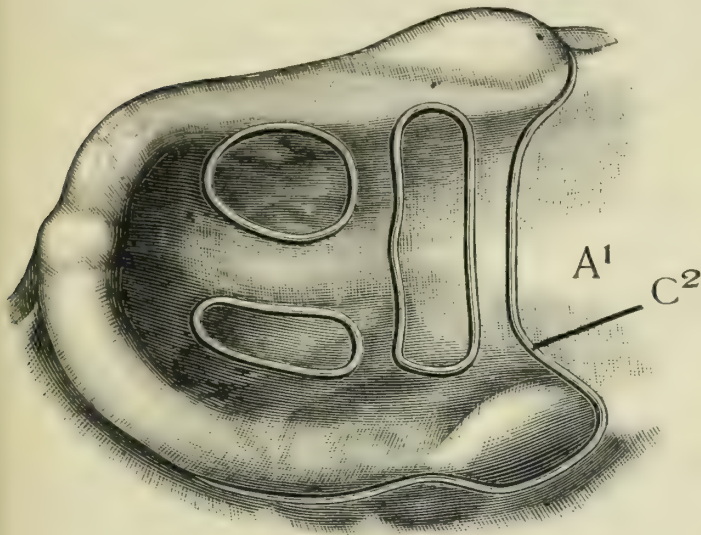
(14) In this instance masticatory lateral stress in the direction of either arrow would be counteracted by the gravity of the denture pressing against the upward slope of the jaw, and the conse-

In the construction of complete lower dentures it is of importance to provide for such incisive occlusion with the upper denture that the contactive stress on the lower incisors shall be downward and backward (see lower arrow, Fig. 4), with a resultant reversal of the effects observed with reference to the upper denture of Fig. 4; the leverage in the molar region of the lower plate P^2 , Fig.

6, tending to its detention instead of its displacement.

Fig. 7 is presented to exemplify the corresponding or correlated behavior of a wire-dentored struck-metal partial plate similar in appearance to the denture represented in Fig. 3.

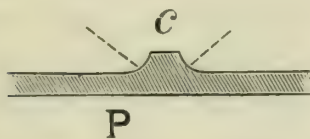
FIG. 8.



The extent, inclusion, height, and outline of either the channeled or wire-formed dentor-adjunct in any presenting case is subject to the judgment, experience, and skill of the dentist in charge, some suggestive shapes being shown in Fig. 8.

When at any point the dentor is too high, producing irritation of the

FIG. 9.

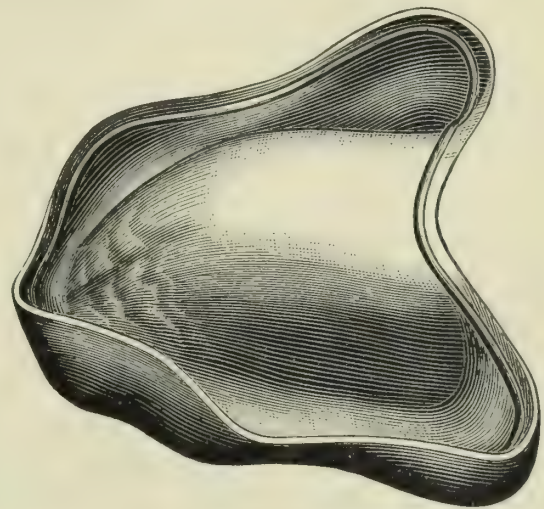


dentured membrane, or, in protruberant jaws, preventing the placing of the denture in position, the crest of the dentor may be ground off with stump wheel and polished as at *c*, Fig. 9, the dotted lines indicating the correct rounded solder junction of the dentor with the plate.

When, as in Fig. 8, the channel C^2 will form a dentor that nearly outlines the plate surface, a vault dentor will seldom be requisite (see Fig. 10), since the sustaining stress is thus located at the most

effective peripheral region for denture detention; while the long leverage of the palatal dentor extension is eminently efficient in resistance to the biting action which is the foremost factor in the actual detachment of the denture. The forward force for fracturing the film and prying off the plate at this transverse border against the there most-potent air pressure meets its match whenever the correct constructive conditions and contrivances have been skilfully materialized in the denture. Among the excellent practical results of adopting the dentor feature should be the absence of

FIG. 10.



that hump over the old common vacuum chamber which so often nearly obliterates the anterior arch of the vault, mumbles the speech, and issues a warning whistle at the utterance of nearly every train of thought, whereas the dentored denture permits the vault region of the plate to be made suitably thin for rugæ representation; thus providing for correct vocalization and free tongue movements consonant with the highest and most practical type of dental prosthetic production.

Several of the figures will serve to illustrate the correlative scheme of dentured dentures. For instance, a struck-metal plate, while still in the counter-die, may, with a suitable tool, have a continuous groove formed by repoussé work along the course of the wire dentor shown in Fig. 10. In that event the initial retention of the denture will be

by a. p., but the plate dentee will soon be filled by an M dentor, and the improved detention ensue. A vulcanite, celluloid, or cast-metal upper or lower denture may likewise be improved by forming continuous or interrupted dentees in suitable locations by means of a proper sized round bur, followed by a smoothing and polishing point.

A wire-dentored continuous-gum substitute may be deemed the denture *par excellence*; but a perfectly fitting gold

plate, wire-dentored as shown by Fig. 10, and rimmed, roughened, or looped for vulcanite retention, with a series of single gum teeth artistically arranged, united in an electric furnace, and mounted with dense vulcanite to produce a denture similar in appearance to Fig. 2, would constitute an achievement in practical dentistry worthy of the professional proficient who honors the alma mater which he represents by the entitled suffix, D.D.S.

CORRESPONDENCE.

A REPLY TO DR. FLAGG'S DISCLAIMER.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In the September number of the DENTAL COSMOS Professor J. Foster Flagg takes me to task for erroneously crediting to him a statement which should have been given to Professor Henry S. Chase.

In my article entitled "Approximal Fillings in the Incisors," appearing in the August number of the DENTAL COSMOS, I had occasion to use the phrase in question, namely: "In proportion as teeth *need* saving, gold is the *worst* material to use." I said that the phrase quoted was true when applied to cohesive gold, particularly when located in cementum and dentin margins, and that it was untrue when applied to soft gold and to a combination of the soft and cohesive. I set forth what I meant by such combination—the placing of soft gold at the base and finishing with cohesive. The writer is willing for the profession to judge whether or not his contention for the preservative quality of soft gold thus used is true.

Professor Flagg quibbles over my use of the word "indefinitely"—used, as everyone understands, interchangeably with permanently—and says it is vague. If this sort of criticism possesses any virtue, I will ask him to think over his phrase—"what I have always regarded as the broadest, strongest, and most accurately truthful proposition ever made concerning operative dentistry." "Always" is a long time, and taken literally means eternal, forever and afterward, and includes all past decades; and so, taking Professor Flagg at his word, he must have in his prenatal existence prophesied that phrase, "as teeth need saving, etc.," to be true. It strikes me then that "always" is almost or quite as vague as was the use of my word "indefinitely."

Again, that "most accurately truthful" phrase catches me, because, in my limited knowledge of our language, I did not know that degrees of comparison were applicable to truth and accurate.

WM. CRENSHAW, D.D.S.

PROCEEDINGS OF SOCIETIES.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

Thirty-fifth Annual Meeting.

(Continued from page 724.)

Dr. A. R. COOKE then read the report of the Committee on Practice, as follows:

REPORT OF THE COMMITTEE ON PRACTICE.

The current year has been one of advancement along certain lines, and we note a few desirable modifications in practice. The general principles of operative dentistry are well founded, and we look for little decided change from year to year.

Our early ideas of extension for prevention, so called, have received the modification which experience alone can afford, and we are reaping good results from the innovation.

A reasonable appreciation of the fitness of filling materials for individual cases is affording relief from excessive strain upon both patient and operator, and progress is resulting in the preservation of badly diseased organs.

The systematic study of the oral secretions in relation to caries and constitutional disturbances is receiving the attention of some of our best students, and it is the hope of your committee that these investigations may continue until conclusions which may be applied in daily practice are reached.

The future advancement of our profession largely rests upon a better knowledge of the active agents in the production of caries and a general attention to prophylaxis. Prophylaxis has been defined as "the art of preserving from or of preventing disease." Now we consider the first requisite for such prevention to

be a healthy, perfectly formed organ—one which has all the virtues of good articulation, ample blood supply, and normal environment. Too little attention has been given to the early habits of mastication as well as the character of the food which children receive from the age when the permanent molars begin to form. There can be no development without an adequate blood supply, and this cannot be secured without proper exercise. Such exercise will not be had until children are forced by circumstances to more thoroughly masticate their food. The immediate effect of such exercise is to increase the circulation in all the surrounding tissues, insuring a better growth, a more resisting organ, and a healthier action of the salivary as well as the mucous glands. The ordinary diet contains ample amounts of calcium and other ingredients to form a perfect set of teeth if we can only have it properly placed. How can the children masticate their food if the deciduous teeth are defective? Not only are they unable to do so, but habits are being formed which cling to them long after the loss of the deciduous teeth. This constitutes a demand for more careful attention to children's teeth. It would be interesting to have determined the effect upon the character and composition of the oral secretions of a continued diet demanding the extreme amount of mastication. All of our investigations point to vitiated oral secretions as a prime factor in dental caries. Correct the secretions and preserve the teeth!

When we shall have determined what

constitutes normal saliva, we shall be in position to make decided advancement in this line. Micro-organisms, as an agent in caries, are to be constantly combated. Can the oral cavity be made sterile? Most certainly not, but we can reduce the number and activity of the micro-organisms by limiting the amount of their food. An intelligent appreciation of this fact by the patient will do much to assist in the daily routine which has so often been prescribed, and with which you all are familiar. The careful mechanical removal of all traces of food with brush, dentifrice, floss silk, etc., must be insisted upon. Your committee thinks that the antiseptic value of tooth-washes has been overestimated. While they may be distinctly germicidal in laboratory experiments, the time which the ordinary patient retains them in the mouth is not sufficient to accomplish much. Their virtues are more in that they are an incentive to care on the part of the patient and in that they leave a pleasant taste in the mouth.

Pyorrhea alveolaris, with all its synonyms, is still before us. Little new matter in this line has been brought out this year. Your committee holds that more can be done by prophylactic measures than in any other way. If pyorrhea be of local origin, we can do no better than to keep the dental organs scrupulously clean from early life, and in cases which indicate a diathetic complication demand an early attention to such diathesis in combination with the local treatment.

No branch of dental practice demands a thorough reorganization more than that of prosthetic dentistry. Our construction of plates and crowns and bridges is far from sanitary. Too much stress cannot be placed upon the necessity for more care in producing appliances which are not only more nearly perfect mechanically, but are in a measure self-cleansing. A casual examination of the ordinary cases is all that is necessary to convince one of this statement. Not only are such appliances a menace to the remaining teeth, but they are a detriment to the general health.

Much diversity of opinion prevails on the subject of root-canal treatment and filling, which should be reduced by definite experiment and demonstration as to what constitutes success in these cases. The increasing demand for the preservation of pulpless teeth leads every operator into this work, and the result is that we have endless numbers of fistulæ as well as an increase in disturbances of a reflex nature. These seemingly slight disturbances may be the cause of much trouble in neurotic patients. The slipshod processes of devitalization, so-called mummification, and methods other than the complete removal of pulp-canal contents followed by antiseptic filling, should be abandoned as unsuccessful and unscientific. Certainly the laws governing asepsis and inflammation are explicit and open to all who will read them. The work of Dr. Webster of Toronto, which was in part presented before this society last season, is a move in the right direction.

Your committee classes as failures all pulpless treated teeth which in any way at any time make the patient conscious of their presence, either by pericementitis, reflex nervous disturbances, or sensitivity to changes of systemic condition. We need scientific as opposed to empirical standards on this subject—an investigation separate from the personal idea of the success which one attains by his pet method.

Should orthodontia be made a specialty? There are many ideas upon this subject, but the trend of the times seems to be in its favor. Your committee favors the judicious extension of our profession in the way of specialties where the circumstances are such as to insure success.

With the changes in equipment and instruments you are all familiar, but I am inclined to call attention to the Crenshaw matrix as a decided advance for the class of cases for which it is devised.

Discussion.

Dr. W. J. TURNER, Brooklyn. I would like to say a few words in favor of the mouth-wash, which has been alluded to

unfavorably in the report. Many use a mouth-wash by taking but a small quantity in the mouth at a time, and almost immediately ejecting it. I think that when used in that way it is of no value at all. A surgeon in cleansing his hands occupies considerable time. The anti-septic or disinfectant of which he makes use is in sufficient quantity to thoroughly bathe the parts, and it is kept in contact with the hands long enough to accomplish the purpose. For a like purpose, enough of a mouth-wash should be taken in to thoroughly bathe the parts when the cheeks and lips are distended. Its mechanical action should be taken advantage of by forcibly swishing it about in the mouth, and this should be kept up for at least five minutes at a time, or better still, ten minutes. Such a procedure will be very tiresome at first, but after a while it will become easy. In examining mouths that are habitually unclean, notwithstanding the use of the tooth-brush, we find a condition of more or less stagnation between the cheeks and teeth and gums, especially in the pockets formed at the juncture of the gums and cheeks. The distention of this space with a mouth-wash not only cleanses the parts, but it begets a habit of movement of the surrounding muscles, so that these spaces do not collect material that becomes foul and infects the whole buccal cavity. I have been instructing a few of my patients in this process, and I have seen some of the filthiest mouths changed to the cleanest. I find in my own case that tartar does not collect upon my teeth to the extent it did before I used a mouth-wash in the way described. When tartar is first deposited upon the teeth it is not a dense adherent mass, but semi-gelatinous, and most of it that the tooth-brush does not reach may be washed off mechanically by the movement of a mouth-wash. I use for this purpose ten drops of formalin to a pint of water.

Dr. R. M. SANGER, East Orange, N. J. I would like to make a few remarks in regard to mouth-washes, because the essayist laid stress upon their uselessness and Dr. Turner defended them. Mouth-washes in themselves, as the aver-

age patient uses them, are of very little value. The world has been during its whole history looking for a specific. From the early days of the human race men searched for the spring of health, hoping thereby to find some source by which they might enjoy eternal youth. Our dental patients come to us with that expression under a different head. They ask, "Doctor, what can I do, or rather, what can I take, to make my teeth better." That is a question that has come to us time after time, and a question we would gladly answer by giving a prescription if we were able, but we all know there is no specific.

Often the dentist recommends a mouth-wash, with the result that the patient immediately thinks he has found a specific, the tendency of such a recommendation being contrary, in my belief, to what Dr. Turner has said, because the patient does not follow the directions, but, believing that he has found a specific, uses it carelessly and expects as much good from it as if he had used it as he should have done. Only the other day I said to a patient, "You are growing careless in the care of your teeth. They are not in the condition they usually are when you come to me for your semi-annual examination." She said, "Why, doctor, I use such and such a mouth-wash twice a day," and she considered that a sufficient argument to answer my complaint of the lack of proper care of her teeth. I believe that a mouth-wash is worse than useless, it is a sin, if when given to patients they are led to believe that they have a specific. You must accompany that mouth-wash with such instructions as prophylaxis demands.

Dr. V. H. JACKSON, New York. I am rather reluctant to talk on such a broad subject without preparation, although I am very enthusiastic over the work of cleansing the mouth and teeth in all stages of life from childhood up. Friction with a brush and powder is the first essential. I direct patients how to use the brush, describing what kind of a brush to choose—one with sufficient bristles and not too stiff, as some of the bristles have to bend to let others reach

between the teeth, and with the bristles not too soft, as generally considerable stiffness is required to cause the necessary friction for removing the collection. Some brushes on the market have not enough bristles, consequently they prick the gums, but are not supported sufficiently one by another to cause the necessary friction in cleaning, especially back of the lower incisors. Benefit to the gums is derived from friction, if not too severe. Collection on the teeth is an irritant to the gums, causing them to become congested and bleed easily, therefore I tell patients, if the gums bleed, to brush harder. When this is persisted in, and the deposits removed, the gums will become more firm and healthy, and any pockets that may have formed about the teeth will gradually disappear if the disease is not too far advanced. I tell them to brush downward or away from the gums principally, as in brushing across the teeth the bristles jump from one tooth to another and do not reach between them, but in making the motion downward from the gums, or up and down, the brush passes easily between the teeth, causing friction on their approximal surfaces. This is demonstrated by making these movements with a brush across two pencils.

In the use of tooth-picks, I prefer soft wood tooth-picks rather than hard, as they yield and adapt themselves more readily to the surface of the teeth.

In cleansing, all deposits should be removed. Clean thoroughly the teeth of every patient. What is tartar, and how is it produced? It is principally broken-down tissue excreted by the glands from the blood and deposited on the teeth. It should be held in solution, but when there is a lack of fluidity, the blood becomes saturated, and when excreted with the saliva, in coming to the air it is deposited on the teeth. The blood is the carrier of nutrition and waste products through the canals of the body. I have for years in these cases recommended drinking freely of water, thus increasing the fluidity of the blood, and taking plenty of exercise for improving the physical tone. In certain conditions the

physician says the blood is too thick, meaning a lack of fluidity and containing much that should be eliminated. Drinking freely of water helps to hold the calcareous material in solution and to float it out of the system, at the same time lessening the tendency of its irritating and diseasing the glands and of its causing an unnatural deposit in different parts of the body. In cases of pyorrhea, I think we should try to cause more thorough elimination.

Massaging the gums is of benefit. Chewing gum stimulates the tissues and brings on a better circulation by giving the teeth additional work. It also develops and strengthens the muscles, encouraging better trituration of the food. The chewing of gum should not be indulged in for a longer period than fifteen minutes after meals, owing to the detrimental effect of an oversecretion of saliva. A mouth-wash is acceptable as a disinfectant, and is beneficial as such, but any solution strong enough to remove calcareous deposits from the teeth is likely to affect tooth-structure. Any good mouth-wash can be used for sterilizing the mouth and gum pockets about the teeth, but depend on friction with a good brush and powder for removing collections. There are many good mouth-washes on the market, but care should be exercised in choosing ones to recommend. Some preparations are good disinfectants, but emulsify and disorganize the saliva, interfering with the natural lubricant of the teeth, encouraging abrasion of the occlusal surfaces, the teeth of one arch wearing the teeth of the opposite arch, causing the teeth to feel as if on edge. Some of the solutions as mentioned are not suitable for sterilizing regulating apparatus, especially base-metal fixtures, as they tarnish and corrode the metal; therefore in cleansing apparatus the antiseptic should be non-corrosive, and the appliance should be polished with a brush and powder, such as powdered pumice.

Dr. M. L. RHEIN, New York city, then read his paper entitled "The Trained Dental Nurse." (Published in

full in the DENTAL COSMOS for August, at page 628.)

Discussion.

Dr. JOHN I. HART, New York. 'This subject has been so clearly stated to you that I fail to see how any remarks I may make will clarify it at all. It is so novel an idea that all must have some views—possibly divergent views—on it, and if we are to proceed to adopt the ideas enunciated by your essayist, we should proceed on some definite line, having all care as to the best course to proceed upon. That excellent results can be achieved if this work be carefully done can be demonstrated if we look at any patients treated by Dr. Smith of Philadelphia or Dr. Taylor of Hartford. No doubt others are succeeding as well as they, but I think credit should be given where due, and probably they have done more to call attention to the possibilities of this work than any other individuals. The matter for our consideration is, Will this permission be abused if granted to the dental nurse? I feel that a law sufficiently strong can be drawn so that the dental nurse will not take the opportunity of practicing general dentistry any more than the medical nurse would attempt to interfere with the work of the general surgeon. And if a law can be so drawn that the work we have been doing for the past years—to stop the unlicensed dental practitioner from practicing dentistry—then I do not see how anybody can object to this definite advance, which does not compel any individual to make use of the dental nurse, but permits those who can see that their patients can be benefited by such use to employ such individuals. And I think the influence of the Dental Society of the State of New York should be used in furthering and supporting the idea as suggested by your essayist.

Dr. WM. JARVIE, Brooklyn. I listened with a great deal of pleasure to Dr. Rhein's paper, for it is one of the ablest and clearest arguments in favor of dental nurses which can be made. It will be conceded by all that the nearer we approach perfect cleanliness in the mouth

the less decay we will have and the fewer teeth will be lost. If thorough prophylaxis of the mouth were practiced we would see comparatively few of that class of cases which so frequently we see in the mouths of people over forty years of age; their teeth lost, or, if not lost, so hopelessly loose that they cannot be made firm or restored to usefulness. It seems to me that the trained and skilled fingers of a woman are infinitely better adapted to the work of removing tartar and thoroughly cleaning and polishing the teeth than are those of men. The delicacy of touch and peculiar finger skill which women are capable of developing, as instanced in their embroidery and needlework, is just what is required in this class of cases. This delicacy and fineness of touch would enable them much better than men to follow the root under the gum with a keen instrument, and to tell with certainty the condition of the surface of the cementum where it cannot be seen.

Careful and proper training under competent instructors should furnish for us the trained dental nurse, who would not only prove a great advantage to us as dentists, but be of great benefit to the community at large.

I have not the least doubt that a law could be carefully drawn which would put around this class the proper safeguards, and I do not see why the trained dental nurse should not be allowed to treat cases requiring dental hygiene just as the medical or surgical nurse cares for the patients of the physician or surgeon in their absence, but under their direction. If it be proper to have a nurse to assist the physician or surgeon, it is just as proper to have one to assist the dentist. And I feel certain that if we can have a class of young women trained to do this work, it will be done much better than if the dentist with a large practice, and who has not the time to do it thoroughly, attempts to do it himself.

Dr. H. D. HATCH, New York. To those of us who were here last year this subject has a familiar ring. I remember Dr. Low of Buffalo speaking along this same line, only he styled the dental nurse

the "odontocure," and I think his views were largely on the line of Dr. Rhein's. I believe in the paper and wish the thing could be accomplished, but I am afraid that if we complicate our dental laws we may bring on trouble, as I think we have too many laws already, and the moment you try to get laws of this kind passed the populace rises up and says, "More class legislation!" I think the best plan is to accomplish all we can with as few laws as possible.

Dr. F. W. Low, Buffalo. I am heartily in sympathy with the paper read by Dr. Rhein, and if nobody else is prepared to do it, I shall make the motion that a committee be appointed, or the Law Committee be requested to consider the matter during the coming year and make a report at the next annual meeting of the society.

Dr. F. T. VAN WOERT, Brooklyn. I feel that there has not been presented to the dental profession for a number of years a subject of as much importance as that presented by the essayist. There is no doubt in my mind that the trained dental nurse is one of the necessary accessories to the dental practitioner. Just how best to accomplish this, I will admit, is somewhat of a problem, but I believe that this society is equal to any such problem, and I believe we can solve it in less than two or three years. I think there is no necessity of carrying this over until next year. It can be done now, and steps can be taken to bring about a modification of the law to this end.

My personal experience with the work makes me believe what the doctor says about its being difficult. I had two or three patients for whom I felt that I must do something radical, different from what I was capable of doing myself, and I sent them to Dr. Rhein. Now, I believe that the ordinary cleansing of the teeth I can do as well as the average man, but I must admit that I was astonished at the results obtained by Dr. Rhein. You will understand, of course, that the patients were not treated by Dr. Rhein, but by men trained by him to do this work. This was evidence to me that there should be some care and skill in

the education of those who are to do this particular branch of the work. Truly, if you could have seen those mouths before and afterward, you would see the necessity of training such individuals as he is training. Now, I believe we are just as much entitled to trained and skilled nurses as the general practitioner, and there is no question that it would be a great benefit to humanity. I do not doubt that a law can be made making it impossible for a nurse to become a general practitioner without a degree and state license. Neither do I believe she would have the desire to become a general practitioner with the necessary qualifications. Therefore, considering all these things in that light I have a resolution to offer which I think the society will do well to adopt, as follows:

RESOLVED, That the New York State Dental Society do hereby recommend the Legislative Committee to use their best endeavors to have the dental law amended in conformity with the views expressed in the paper on "Trained Dental Nurses."

Dr. V. H. JACKSON, New York. I would like to ask if it is the idea to include young men who are beginning the study of dentistry, or whether the resolution intends the nurse shall be only feminine. I am heartily in accord with the resolution, but I think it best that we should know what we are doing before we adopt it.

Dr. RHEIN. Before putting the resolution to vote, I want to express how extremely gratified I am at the reception of my effort in this direction. It is an end for which I have been laboring for over fifteen years and I have recognized the apathy of dentists in this respect. Now, in the paper I did not speak of the feminine gender for this reason, that the majority of nurses are women, but there is absolutely no restriction in that respect. There is no reason why men should not go into this vocation as well as women. Personally I agree with Dr. Jarvie. I believe that the indomitable amount of patience requisite for the faithful performance of this work can only be found among women. To accomplish ideal results such as we must

have in order to obtain the benefits of prophylaxis I believe much better work can be done by women than men, but there is no intention on my part to make such restriction. Of course you see nurses who get interested enough in medicine go on and get a medical education, and there is no reason why men cannot take up the work, as well as women, with such an object in view.

About the only criticism that has been made against the plan is the possibility of the nurse violating the dental law. This objection is offset because as present conditions are in regard to the case of the nurse, it would be perfectly feasible for me to have a woman do this work and claim she was acting in the capacity of a nurse. The passing of an appropriate law as advocated in what I have said would limit specifically the duties that would devolve upon her, and a law properly framed should have attached to it a penalty that would take her license or prevent her from engaging further in this vocation. In the state of Massachusetts a number of men would like to do this very thing, but they have been threatened with prosecution should they dare to do it. I was told this by members of their dental board. There are many prominent members in the city of Boston who would like to carry out this idea in their offices, but they have refrained simply from fear of prosecution.

There is just one other point that I would like to call your attention to before the vote is taken, and that is this: I am satisfied in my own mind that the care of the teeth at large can best be looked after in this way, and it is absurd to think of specialization along this line, and besides it would be impossible to find a sufficient number of men to do any such work as Dr. Smith outlines, or claims he will devote himself entirely to. None of us have time to attend to this important work, and it is unworthy of our time being spent where so much more important brain-work is called for. I do not reflect upon the occupation, but it can be done by fingers that are deft enough for this work without the requi-

site amount of brain force being expended to master the profession of dentistry.

There is just one other point. I believe the state of New York in dental matters has led the profession for a great many years, and we have the opportunity to-day to advance a step ahead of any state in the Union, and therefore I commend the resolution advocated by Dr. Van Woert regarding the lack of necessity for delay in this matter. There is no reason why the Legislative Committee should not take the matter up at the next session of the legislature.

Dr. HART. Before putting the vote I think we should understand each other. I think the question of Dr. Jackson a very pertinent one. The trained nurse receives a certain amount of instruction before getting a license, and the average medical student would not be permitted to act as a trained nurse, and I think it should hold good with the dental nurse. The trained dental nurse is supposed to have a certain amount of knowledge to do a definite work, and the dental student should not have permission to do that kind of work.

Dr. RHEIN. If my remarks gave the impression that I was in favor of what has just been said I have been misunderstood. What I meant was that there was no reason why a man could not take the same course as a woman, but if he wants to continue on in his studies and become a dentist there is no objection to that. I did not take the position that students be allowed to take up this work in any such manner.

Dr. VAN WOERT. I think in the resolution it was distinctly stated that the legislation would provide means of controlling the practice of this specialty. I did not offer anything in the way of a law; I simply referred that to the committee, to act on a law to protect the profession and not allow the dental student to become a dental nurse, any more than to allow them to become a D.D.S. I fail to see how that construction could have been placed on the resolution.

The PRESIDENT. The resolution stated explicitly that the details of the law

would be left to the Committee on Legislation.

Dr. F. L. AMES, Albany. It would seem to me that Dr. Rhein is putting his foot in it pretty deep when he desires to relegate the task to women on the claim that it requires no great mental caliber; I believe women claim that they are equal to cope with men in almost anything on intellectual lines. And the average dental practice does not seem to warrant anything of the kind. The case of the dental nurse would seem to involve the same question as does that of the medical nurses. These have to serve a term in a medical college for their position and are issued a certificate after they have attained to the degree of proficiency and knowledge that will enable them to become trained nurses, and it would seem that that would be the same course necessary for anyone who desired to become a dental nurse.

It seems to me that it is a little premature for this society to go into any legislation on the subject at this time, and I move that the whole business be left until a year from to-day, to give the members time to digest it, and allow us to try the experiment in our offices and learn to what extent good can be accomplished.

Dr. F. W. PROSEUS, Rochester. I would like to ask Dr. Rhein if the granting of a diploma to these nurses would place them in the same plane as Dr. Smith, who has given his whole life to this work. Our Legislative Committee should act very carefully in this matter.

Dr. RHEIN. It seems to me that the last two speakers really did not hear the paper, or paid very little attention to it, because they have both gone far away from the remarks made in it. The speaker before the last one certainly did not pay any attention to the paper, because I dwelt upon the training necessary for the nurse in a training-school connected with a hospital which would take a year or a year and a half. A nurse of this kind has no responsibilities except to follow the directions of the dentist. She is to occupy the same relation to the dentist as the general nurse occupies to

the surgeon. If a surgeon has a patient to operate upon, he tells the nurse to get the patient in condition for the operation, that means see that the bowels are cleared, or in case the operation is in the abdominal portion, to see that the patient is shaved, and the parts sterile. The trained nurse does for the patient in these cases precisely what we are asking for the trained nurse to do in the mouth—put it in condition so as to preclude the possibility of infection. I have tried to assure myself of this point by talking of the subject to general practitioners, and there is not one who did not think favorably of it, and said they did not understand why we had overlooked this important matter. There is no responsibility for a nurse of this kind, and it is not intended that they should do surgical work in the mouth. They are to do simply the cleansing and polishing of the teeth, filling the prescription of the dentist who has the patient's welfare in charge. I hope there will be no postponement in this matter. There is nothing to be gained by delaying action on it. If it is the opinion that we do not want it, it is just as easily settled now as it would be a year from to-day.

Dr. S. L. GOLDSMITH, New York. I hardly think that the members have fully digested the sense of the resolution. I understood that the resolution simply refers the matter to the Legislative Committee, with the expression of the sense of this society that some legislation be passed favorable to this question.

Dr. AMES. I move that the resolution be laid on the table.

There being no second to Dr. Ames' motion, the motion to adopt the resolution was put and unanimously carried.

A communication received from Dr. W. C. BARRETT, Buffalo, was read in his absence, as follows:

A LINK IN OUR PROFESSIONAL HISTORY.

In January 1880, B. M. Wilkerson, the inventor of the Wilkerson chair, commenced the publication in Baltimore of the *Independent Practitioner*, a monthly journal to be devoted to medi-

cine and dentistry. In December 1882 I became its dental, and in May 1883 its sole editor and (through a combination of circumstances) its proprietor. I felt that I had drawn an elephant, with which I did not know just what to do. I accordingly visited New York and called upon a few prominent men in the profession, and sought their advice. The result was the forming of a syndicate for the publication of the journal, composed of the following dentists: Frank Abbott, W. C. Barrett, C. F. W. Bödecker, William Carr, C. E. Francis, O. E. Hill, William Jarvie, A. L. Northrup, and S. B. Palmer. Drs. Carr, Abbott, and Hill were chosen members of the executive committee; Dr. C. E. Francis became treasurer, and I was continued as editor.

In the twenty-odd years which have elapsed since that time, Drs. Abbott, Hill, and Palmer have passed over to the majority, Dr. Bödecker has settled in a foreign country, and Dr. Francis has retired from active practice. The remainder are yet attempting to serve their profession as best they can. It is a notable event that in the very first syndicate number, for May 1883, Dr. W. D. Miller of Berlin, Germany, who afterward became a member of our syndicate, published in the *Independent Practitioner* the earliest of that wonderful series of articles on dental caries which, for the first time, solved the question of the etiology of that disease and made his name a household word wherever scientific dentistry has an existence.

Those of the original syndicate who are now present, Drs. Carr and Jarvie, will recollect with what earnestness we went over the professional status, and considered the evils that in our opinion needed to be corrected. We were a body of enthusiasts, and were earnestly solicitous to make our mark in our chosen profession by serving it to the extent of our ability. I remained in New York for some time, and we met daily to look over the field and to formulate plans for future action. We decided that the educational question was the most important, and that it most loudly demanded our active interference. There were

then in existence about fifteen reputable dental colleges, and the standard of excellence was not at all satisfactory to us, nor to the world of dentistry generally. The college course consisted of two terms, which were five months long—provided no possible excuse for abbreviating them could be found. Five years' practice was generally accepted as an equivalent for one of these terms, and the second one was often shortened very materially at each end, so that it was possible for a man who could present some evidence—or could assert there was in existence evidence—that he had been in some capacity connected with dentistry for five years, to receive the diploma of a dental college at the end of three months' actual attendance. Deans did not always inquire too closely into the evidence offered, as such impertinence might be interpreted as a reflection upon the veracity of the proposed student.

This system might work satisfactorily in the case of natives whose status and qualifications could be easily determined, but in the reception of foreign students there were great opportunities for fraud. An applicant unacquainted with the English language could present a certificate from some possibly unknown person, that the bearer had been in dental practice for five years, and he would be promptly matriculated and graduated at the end of a term that might have been half expired at the time of entrance. Dental servants who had been employed in sweeping out a dental office, barbers utterly illiterate, and promiscuous hangers-on of an office, were sometimes sent back to Europe after an absence of three or four months, with a diploma in Latin which they could not read, with the title of doctor, and the supposed colleagues of graduates of European universities. All this had degraded our professional title until it was fast becoming a byword among men of learning and culture. It is not to be understood that all the colleges were engaged in disreputable work, but it was true of far too many of them.

Here was our windmill, which like true Quixotic chevaliers we would at-

tack. I had but lately returned from a visit to Europe, and felt myself armed with a sufficiency of instances in question. My colleagues stood ready like so many faithful Sancho Panzas to help to the utmost. One was a dean of a college, but he promised that if we unearthed any testimony that implicated his own school in irregular work he would not interpose an obstacle to prevent the publication of the uttermost facts. The first instance of what we deemed irregular graduation of a student should be given to the world regardless of whom it implicated. We stood with our lightning rod up waiting for the stroke.

It came in the due process of time, and from an unexpected quarter. In May 1884 I received a communication complaining of the irregular graduation of certain well-known and highly esteemed practitioners, who had received a diploma in course from the oldest dental college in the world, *sine curriculo* and after an examination which it was alleged was but a mere form. In accordance with our agreement I had the article put in type for the June number, and took the proof with me to Albany, at the time of the meeting of the State Dental Society in May, when I knew I should meet my colleagues. I presented it at a special conference at the old Delavan House, and found we were not a unit as to the advisability of its publication. It was declared, without denial, that these men were our best friends, and that they were honorable, reputable members of the profession, and had been such for years; and further, that they were emphatically worthy to receive the degree. It was also urged that the college granting the degrees was but following long-established precedent; that other schools had been guilty of more gross irregularities, and that to single it out for public criticism was an injustice.

The answer was that all this was quite true; that the school was certainly no worse than others, while the men were unobjectionable. But the college had graduated them practically without attendance and irregularly. We stood

pledged to each other to give to the world the very first instance coming to our knowledge of such an irregularity, and we must not shrink from our responsibilities because this first attested instance came from an unexpected source. The opposition to the publication was thereupon withdrawn, and the article appeared in the June number with all the names in full.

The predictions of those who had anticipated a storm from the giving of the matter publicity were most emphatically verified. The tempest broke, and there was thunder and lightning from all parts of the sky. The article was succeeded by others. As editor I tried to eliminate as many of the personalities as was possible and to guide the whirlwind to some practical conclusion.

But there had been another and more potent influence invoked, one which could neither be intimidated nor ignored. During the session of the State Society, after it had been determined that we would make a fight for a higher educational standard, I drew up and lodged with the secretary, Dr. J. E. Line, the following resolution, and when it was read supported it as forcibly as I could. It will be found on page 38 of the volume of Transactions of the society for the year 1884:

RESOLVED, That the secretary of the society be instructed to summon the faculty of the Baltimore College of Dental Surgery to appear at the next annual meeting of this society and show cause why, for alleged irregular granting of its diplomas, the name of said college should not be stricken from the list of colleges whose degrees are recognized by this society as a sufficient qualification for a license to practice dentistry in this state; and that until such cause be satisfactorily shown, any of its diplomas that may be hereafter issued shall not be accepted by the Dental Society of the State of New York as sufficient authority for the practice of dentistry.

All this matter was given publicity in the *Independent Practitioner*, and it was a bombshell. A meeting of the representatives of the principal dental colleges was called to assemble in the Sturtevant House, in New York city, on

Monday, August 4, 1884, and the dean of the Baltimore Dental College was foremost in promoting it and furthering its objects. The following schools sent delegates or were represented by proxies:

Baltimore College of Dental Surgery.
 University of Michigan Dental Department.
 University of Pennsylvania Dental Department.
 Philadelphia Dental College.
 Harvard University, Dental Department.
 Ohio Dental College.
 Boston Dental College.
 Chicago College of Dental Surgery.
 University of Iowa Dental Department.
 Pennsylvania Dental College.
 New York College of Dentistry.
 University of California Dental Department.
 Kansas City Dental College.

A constitution was adopted and signed by the delegates of all the colleges represented, except Harvard, whose delegate pleaded lack of authority, and the University of California and the Kansas City Dental College, which were represented by letter. And thus was born the National Association of Dental Faculties which has since that time had such an honorable and useful career. At this its first meeting it provided—

First. That two full years' attendance be required as a preliminary to graduation.

Second. That a preliminary examination be required for entrance, the standard to be a good common-school English education.

Third. The courses should be graded, and a general curriculum of studies should be recommended.

It will thus be seen that the essentials of an improved standard were at once adopted, and it was announced that this should be raised as fast as circumstances would permit. A three years' course was at first decided upon, but it was finally thought best to wait a little time for that.

At the annual meeting of the Dental Society of the State of New York for 1885, the dean of the Baltimore Dental College, the late Prof. R. B. Winder, appeared in answer to the summons. He

urged that a great injustice had been done his school in placing it under ban for a full year without an opportunity to meet any accusers. He admitted the graduation of the students as charged, but said that it was provided for in their charter, that it was a custom which they had followed ever since the organization of the college, and that other schools were doing the same thing. He was very candid in his statements, and his remarks made a very deep impression upon those present. He finally added that an organization of the principal colleges had been effected, and that they had adopted a regulation forbidding the conferring of a regular diploma except upon the completion of a full two years' course of study, and the Baltimore College would henceforth be bound by that rule and would obey it, notwithstanding the provisions of its charter.

Thereupon I arose and asked Professor Winder if we were to understand definitely that the Baltimore College was pledged to grant no more diplomas *sine curriculo*. I was answered that such was the case. I then moved that the Dental Society of the State of New York express its entire confidence in the Baltimore College of Dental Surgery.

An animated debate followed, in which Professor Winder was assured that the original resolution was not adopted because of enmity to his school, but that the society was very strongly opposed to the granting of the degree of Doctor of Dental Surgery except at the end of a complete course of study. The question was one of principle and not of men, and all that was asked was that the custom, if custom it was, should be abandoned. This having been done through the organization of the Dental Faculties Association, nothing more could be required. The resolution of confidence was carried and the incident thus ended.

I have written out this statement of half-forgotten matters in order that the real origin of the formation of the Faculties Association might be placed on record, and that the important part played by the Dental Society of the State of New York in bringing about certain

reforms may be understood. It is not asserted that, even had not the *Independent Practitioner* published the articles which it did, and had not the society interposed its strong arm to complete the work, a reform in the granting of diplomas would not have been brought about, but it seems certain that, had not some positive expression been made on the part of the profession, that reform would not have been as complete as it was, nor would the standard of dental education have been so quickly advanced to the position which it occupies to-day.

Evening Session.

At the evening session the society listened to Dr. R. M. SANGER, East Orange, N. J., on the subject of "Two Crowns: an Illustrated Lecture." (Published in August COSMOS, at page 620.) After a brief discussion of Dr. Sanger's lecture,

Dr. F. T. VAN WOERT, Brooklyn, gave a "Practical Demonstration of the Roentgen Rays in Dentistry," with lantern exhibit.

Discussion.

Dr. F. W., Low, Buffalo. Dr. Van Woert's illustrations, as well as his remarks, prove pretty conclusively that diagnosis is not entirely freed from empiricism by the assistance of the radiograph silhouette.

My first experience with one of these "ghosts" led to erroneous diagnosis. Luckily, however, no harm was done, for I simply burred out a tooth-socket over which the gum tissue had failed to completely heal, subsequent to an extraction done nearly two years previous to my attempted operation. The radiograph showed a shadow which I felt justified in diagnosing as a portion of unextracted tooth-root. The operation disclosed no such root present. If any root tissue was really there it was in so soft and disintegrated a state that it burred out with the diseased alveolus and was indistinguishable. The outcome, it is true, justified the operation, for the gum tissue immediately and completely healed. That, however, did not in any measure

lessen my chagrin upon finding that I had apparently been misled by the radiograph.

With reference to the three pictures which Dr. Van Woert last exhibited, I brought them along only to show how utterly valueless they can be turned out when one is somewhat inexperienced with radiograph work upon that particular region of the anatomy which may be submitted for illustration. The young men who exposed and developed these pictures are experts and would experience no difficulty in abdominal or extremity work, yet the time for exposure, the time for development, and the strength of the developer were each and all erroneously calculated, and consequently these pictures are entirely valueless in aiding me to form an opinion on the subject I had under consideration. Had Dr. Van Woert taken these I might have had something of interest to offer you, I am sure, for Dr. Price of Cleveland, Ohio, gave me positive assurance that it was quite possible of accomplishment, and he has promised to undertake and report to me in the near future a series of experiments which will prove the comparative value of different materials in regard to absolute closure of pulp-chambers and root-canals.

A MEMBER. I would like to ask if the danger of burning the tissues has been overcome.

Dr. VAN WOERT. That has been a matter of the past for a long time. The most extended exposures I have ever made would not exceed eight or nine minutes, depending upon the condition of the tissues, and I have had no trouble from this source.

Dr. Van Woert then said that if there were any members present who had a case that would be interesting, he would make some radiographs to show those present how it was done. He then made exposures for several of the members, to be developed later.

Dr. HOFHEINZ. We have seen the photographs shown by Dr. Van Woert, and realize the value of the X ray in this work, and I would like to ask his opinion with regard to the therapeutic effect of

the X ray in the treatment of pyorrhea alveolaris. I have known many cases of skin disease which were improved by the X ray, and would like to have an opinion as to the therapeutic effect upon pyorrhea alveolaris.

Dr. VAN WOERT. I have given considerable thought to that question, but have made little practical investigation, because I have yet to see clearly how you are going to get benefit in this disease without surgical procedure in the beginning. Understanding that alveolar pyorrhea deposits are the aggravating cause of the disease, you must go to the root of the trouble to have any effect. That being the case, I cannot conceive of what practical benefit the X rays are going to be in that particular direction. It is a well-known fact that perfect surgical procedure in pyorrhea is almost certain to be followed by good results. If you can get to the trouble in time, and get the good results that Dr. Rhein does, I fail to see where the X rays are going to be applicable to this disease. I do not mean to be understood as saying they are not, for as to that I cannot say. The therapeutic value of the X rays in general skin diseases, such as lupus, epithelioma, etc., is well established; but the question of pyorrhea alveolaris is another thing. In one particular case that had been in the hands of several dentists with the same result, which was under my care with very unsatisfactory results, and in a fit of desperation, to find out if possible what the trouble was at the end of the root, I made a skiagraph. I made two exposures, five and seven minutes; we put in a dressing into the root, and the patient went away for some little time, and when he came back he said, "Well, doctor, that X ray did the work. I have not had any trouble since." I filled the tooth, and it has never given any trouble from that day to this. Dr. Morton of New York claimed that it was the effect of the X ray that cured the tooth; but I doubt it.

The PRESIDENT. If no one else wishes to speak on the subject, I will ask Dr. Van Woert to close the discussion.

Dr. VAN WOERT said that he had noth-

ing further to add except to thank the audience for their kind attention during his talk.

The meeting then adjourned until the morning session.

SECOND DAY—FRIDAY, MAY 15TH.

On the morning of the second day of the meeting,

Dr. EDWARD C. KIRK, Philadelphia, read a paper entitled "A Contribution to the Study of Metabolism." (Printed in full in the July issue of the COSMOS, at page 521.)

The paper gave rise to the following

Discussion.

Dr. WM. JARVIE, Brooklyn. I regret that I have not had an opportunity to read this paper in advance of the meeting and so be better prepared to discuss it, but I will do the best I can, knowing that any shortcomings in what I may say will be made up for by the gentlemen who are to succeed me. Dr. Kirk in beginning referred to Dr. Truman and his criticism of the use of the word saliva as employed by the essayist in his papers, and some ten days ago I felt myself among the class referred to when he said he could not help employing these words—he was born that way; that he supplied the words, and those who did not understand them would have to purchase dictionaries and find out the meanings for themselves. Fortunately I did not have to purchase dictionaries, as I had them, but I did consult them, and attributed the necessity of my doing so to my own lack of knowledge and not to any desire on the part of Dr. Kirk to employ words that might mystify rather than enlighten. The paper is entirely free of anything that is difficult for the most ordinary mind to understand. The subject is beautifully set before us, and everything plainly and explicitly stated.

The dental profession in this country is greatly indebted to Dr. Michaels of Paris, who undoubtedly furnished the inspiration for Dr. Kirk which caused him to carry out the investigations which have occupied him during the past two

years, and of which we have had the benefit in the various papers he has read before dental societies during that time. Dr. Michaels advanced the theory that examinations of the saliva would determine constitutional conditions much more certainly and definitely than examinations of either the blood or the urine. The result of Dr. Kirk's investigations has been to demonstrate most conclusively to him to what certain well-recognized disease conditions incident to the mouth are due—conditions which are familiar to us all, but the causes of which have always been more or less veiled in obscurity.

Before the Second District Society, at the meeting to which Dr. Kirk refers, the slides from which some of these photographs were taken were exhibited, and let me say in parenthesis that while these photographs are beautiful they give but little idea of the marvelous beauty of the pictures that were thrown upon the screen. These are only in black and white, but on the screen were shown the most exquisitely beautiful colors you ever saw. I never saw a flower in nature so delicately and perfectly colored as were the crystals when depicted upon the screen at that time. He demonstrated that the cause of erosion when the erosion was general throughout the mouth—not only upon one or two teeth, but where the enamel and dentin had wasted away from the labial and lingual aspects of the teeth—was due to a condition of the system which manifests itself in the mouth by a general lactic acid formation, and where the erosion was localized and only affected a few of the teeth it was undoubtedly due to the excretion of hydrogen sodium phosphate from the buccal mucous glands. In the paper read before the Chicago Odontographic Society shortly afterward, and which was the result of investigations along this same line, he demonstrated most positively that cases of rapid wasting away or loss of tooth-substance that had been generally attributed to rapid decay from some cause or other, was but another manifestation of erosion due to this same hydrogen sodium phosphate which had been

excreted by the mucous glands throughout the mouth. So that we as dentists have derived knowledge of great importance from Dr. Kirk's investigations of the saliva. At other times, and particularly to-day, the papers have been devoted largely to metabolism, which I understand to be the chemical changes within the body by which protoplasm is either renewed or changed to perform special functions or else disorganized and prepared for excretion.

In referring to pyorrhea, the essayist has eliminated that class of cases where it is undoubtedly due to local filth and which can be restored to normal conditions by the removal of the cause, and confined himself to that class of cases where in mouths fairly clean and well cared for we find a loss of gum tissue and absorption of the alveolus. Such cases cannot be cured by local treatment alone. Dr. Kirk demonstrated very clearly that they are due to a degenerated condition of the general system, and without scientific and intelligent constitutional treatment the normal conditions of the mouth cannot be restored.

This brings us to the point that we as dentists should be able not only to recognize these mouth manifestations, but to understand the constitutional causes and be prepared to indicate the treatment. Under these circumstances we now refer such patients to their family physician for constitutional treatment; but very, very few physicians have had the necessary special scientific training to make a correct diagnosis and prescribe a remedy. It is rarely that dentists are educated to treat constitutionally the class of cases under discussion. Here and there may be found a Kirk, but they are very few. I am optimistic enough, however, to believe that the future of dentistry is to be largely in the line of prevention, and to advance as we must and as we are sure to do, the standard of dental education must be far in advance of what it is now, and I welcome the plan which some of our universities are almost ready to put into operation, of requiring dental students in some branches to attend the same lectures that the medical

students do. Our art has arrived at that degree of proficiency that the treatment of the results of decay is almost an exact science. But much is to be learned as to the cause and treatment of the absorption of the gums and alveolus and the loosening of the teeth as a result of constitutional conditions, and thus contributions to our knowledge upon this subject such as we have just listened to are of great value to us, and Dr. Kirk has our sincere thanks.

Dr. GEO. V. I. BROWN, Milwaukee, Wis. When I learned yesterday that you were to have a meeting, the temptation to meet again those whom I remembered so pleasantly was so strong that I boarded the Albany boat with Dr. Kirk. I did not know that I would be asked to discuss this paper—a well-nigh impossible undertaking without preparation, but one that I would have felt a great privilege if I could have had a few weeks in which to prepare some sort of an appropriate discussion of the subject. I think you all will agree with me that this is not the kind of paper to be discussed in an offhand manner; it is more than that, for it treats of a subject that requires special study, and one that only a very few original investigators are able or fit to discuss; nevertheless I wish to speak to you of the ideas that have passed rapidly through my mind since I learned that I was to be a victim on this occasion.

In the consideration of a subject of this sort there are two questions which must come before us: first, what is the possible benefit to humanity to be derived from the work, and second, what benefit can or will it be to our own profession—because we finally and invariably reach the more selfish view. The second question is more easily disposed of than the first, and so I will take them in the reverse order. It seems to me that if Dr. Kirk, or anyone else who is identified with the dental profession, by any means aids in bringing to light some new method of diagnosis—remember, I distinguish between method and theory—a method of diagnosis which with certainty enables us to recognize even one disease and thus establish new treatment di-

rected to even one special organ for the successful cure of disease, he will have made the profession of dentistry famous for all time, and settled at once the question so often discussed about the recognition of dentistry in the medical profession. We feel certain that Dr. Kirk has gone far enough to call forth the interest and doubtless the admiration of the best medical men of the world when they understand the nature of the work he is doing. I was very much interested in the absolutely scientific demonstration which seemed to prove so conclusively by both chemic and microscopic study that the appearance of the saliva in individuals affected by certain disorders of the liver was indicative of the disease, and this was identical with the excretions in the case of the goose which was the subject of experiment by a previous investigator (Minkowski) under circumstances with which we are all familiar, and through which it is possible to recognize a definite cause and accurately determined result. This signifies much from the standpoint of the therapist. It means that methods of treatment can be applied to the cure of individuals whose saliva or urine under Dr. Kirk's examination shows crystals of the peculiar forms and having chemical properties such as he has found to be associated with disease of the liver; and the pathology being understood, curative agents may be scientifically administered with reasonable hope of correcting the pathognomonic symptoms and curing the disease. That one thing has done more to open my own eyes than anything else possibly could.

When I have seen Dr. Kirk's illustrations upon the screen, as it has been my privilege to do several times, my mind has gone through a sort of process of evolution in trying to recognize the true meaning of what I saw. The first time I was pleased, of course, but I believed it might be possible that he was indulging in fancies of a utopian character—dreaming of what might be—and I wondered if he or anyone else would ever learn to accurately distinguish between the different forms of crystallization;

yet he has successfully demonstrated that these forms do regularly occur under certain nutritional conditions.

In looking over the pictures last night with Dr. Kirk, and having thought a great deal about this matter in the meantime, I really began to feel that I could distinguish between the different forms shown and that I could recognize them if I saw them again. Then I remembered how I—and you also will doubtless remember how you—learned to recognize objects under the microscope; how the histologic structures all looked very much the same when seen for the first time. I was sometimes skeptical in my own mind as to whether the instructor in the laboratory could really tell the difference in the cells, but of course in time these forms impressed themselves upon our minds, until I was able to recognize the different histological structures; and it is no more unreasonable to conceive that there are definite conditions of the saliva which, shown under polarized light, can be distinguished and ascribed to exact causes than it is to understand the difference between bacteria under certain circumstances recognized by one stain or form or another. These bacteria are relied upon everywhere to point with certainty to the diagnosis of disease. I feel that Dr. Kirk is reducing this to an exact science so far as defining and distinguishing these different forms and assigning to each the proper cause and chemical relation, and in this lies the true scientific importance of his work.

Dr. Kirk has spoken of pyorrhea, and although I do not like to see so broad a subject narrowed down to one disease, yet at this time it may be wise to consider it in this way. I will tell you of a case of pyorrhea that I had within the last year that will probably interest you, and I think will throw a wider light on the subject than the particular form which has been referred to. I had a man in a condition of perverted nutrition which, from having had one other case due to the same affection, I had learned to diagnose with appreciation of the likelihood of fatal termination.

We made an examination of the blood at once, and found that instead of having about 5,000,000 red blood corpuscles, as the count would have shown in the normal state, there were only something like 1,700,000. The liver, lungs, and spleen showed the effect of the disease in postmortem examination of each of these organs, and had anyone known enough to have taken a record of his saliva and examine carefully the abnormal conditions of the salivary glands at an early stage of the affection, when it might have been possible to correct the trouble, his days could very likely have been lengthened. After his blood had gotten into this condition of pernicious anemia we could not cure him. We gave him every possible care and by almost every known means tried to improve the condition of the blood. We gave him phosphates and bone marrow, beef peptonoids, and other concentrated foods, but it was too late to do any good. If, however, we had been able to examine the salivary manifestations before the disease had gone so far, and could have put his liver in a proper condition, we might probably have cured the disease, which we could not do because correct diagnosis was too late, and the man died. And so I prefer to take this illustration as showing the possible danger of pyorrhea, though fortunately it is not so serious. This man died simply because the metabolism, this A factor which Dr. Kirk speaks of, was in a disturbed state.

I had another case in which the disease progressed until a gangrenous condition extended through the hard palate into the nose, and under operation we found that everywhere there was dead bone, and that we would have to cut almost the whole face away in order to remove all the diseased tissue. That is what pyorrhea did for at least one man; not pyorrhea alone, but pyorrhea associated with some conditions of perverted metabolism, naturally following a perverted blood circulation. Thus I had two cases of this character within a short time. They are not so infrequent as one might suppose; there will seem

to be a great many more when we are able to recognize them, and I hope we will all learn to recognize them soon.

The question was asked if the case described was a syphilitic one. It was not. The patient was perfectly healthy so far as outward appearances and family history could prove.

Dr. R. M. SANGER, East Orange, N. J. Mr. President, this is the second time during these researches of Dr. Kirk that it has been my privilege to be among his audience, and I am delighted. Incompetent as I am to discuss the scientific side of the question presented, still there are one or two thoughts that come to my mind as the result of listening to this paper which may be of interest to you. The first of these is the value of knowledge and the ability to impart it. Whether the man who receives it measures up to the full value of the thing, these papers stand as beacon lights guiding us to a higher standard of work—up to results which shall be of great value to our patients, and in that way make us more successful practitioners. To clearly understand the cause of the diseases which we have to treat is necessary to successful practice, and it is just in proportion as our understanding is clear that our success is assured. Dr. Kirk speaks of the equipoise or balance. Physicians years ago spoke of something which they called balance, and the relation it bore to health and disease, and we confidently hope that Dr. Kirk is on the road to solve the problem of what it is that sometimes disturbs that balance, thus enabling us to readily recognize the approach of those disturbing causes and head them off, as Dr. Brown has said, before it is too late.

I make these remarks because I heard some gentleman say before the meeting, "This will be a scientific paper which perhaps we won't measure up to." You never learn to read until you have learned the alphabet, and so, as I sat listening to the essayist, I felt that I was learning a new alphabet which would enable me to read the signs of a new diagnostic language as represented in the saliva of my patients. I have to thank Dr. Kirk from

the bottom of my heart because he is following a line which I believe will bring about a revolution in our diagnostic ability. The trend of medical practice to-day is toward simpler and more scientific methods. The age of so-called shotgun prescriptions, where a dozen medicines were mixed together in the hope that at least one of them would hit the nail on the head, has long since passed. Every step that approaches nearer to revealing the primary causes of disturbed nutritional balance is a direct blessing to patient and practitioner alike. And so, Mr. Chairman, I recognize this paper as a milestone in a new epoch in the history of medical dentistry, and I congratulate you, this society, and myself in being privileged to listen to it.

Dr. C. S. BUTLER, Buffalo. I want to call attention to one point in the paper which I regard as very valuable, and one apparently lost sight of in the discussion thus far, and that is the statement that in our enthusiasm over the bacteriological consideration of disease we have practically overlooked the primary lesions; that is to say, the systemic conditions favorable to the invasion of bacteria. The lowering of the vitality I regard as an exceedingly important point. If that be kept in mind and an effort made to keep the system of the patient in a normal condition, we largely eliminate the danger of infection from bacteria.

Dr. KIRK (closing the discussion). I wish first to thank the audience for their courteous attention to the paper. There are several points that arose in the discussion that it seems to me ought to be referred to, because they represent certain questions in your minds which would perhaps stand as obstacles to your full acceptance of this work, recognizing the possibilities of its usefulness, and taking it up and pursuing it on your own account.

I may say, as Dr. Brown said last night, after working with Dr. Michaels for a while, and before I found out exactly what he was attempting, when I examined his specimens I felt very much in the same mental attitude which I imagine Champollion felt when he first

attempted to translate the figures on the Rosetta Stone. When he first examined the hieroglyphics they were absolutely unintelligible and most puzzling. If I had been asked in the beginning to describe the meaning of what I saw under the microscope, and make a diagnosis, I should have felt very much confused. But after a while I began to see better. As in the deciphering of the Rosetta Stone, Champollion discovered certain figures reproduced in different places, and he accidentally got out a word, and thereafter the deciphering of the record became simple, and we know to-day what was accomplished by deciphering those ancient hieroglyphics, which opened up so much of history to us. The deciphering of the polariscope pictures in the study of disease is closely analogous. The question has been raised as to whether the different forms are actually identified. I have here two pictures, and I think any man here could take these pictures and immediately see that certain features correspond, just as could one who is familiar with these pictures. It is much the same as if you should say of a man's family that his children resemble him; the same principle of resemblance is applied here.

As regards the definiteness of all these things, I know they all look very much alike to us, but the question as to what they are is the one point that is gotten out by careful systematic investigation. I spent a month in determining what made those oxalic crystals in the case referred to in the paper—just to ascertain the nutritional error, and to be able to say just where that particular form came from. We found them in the saliva, but not in the urine. We finally isolated the thing, and when I did that I felt that I had done enough for that day. It was an important thing because it gave us exactly the fault in his nutritional process that was making him an old man. As soon as this was discovered, we applied the therapeutics, the stopping of the leakage, and after fifteen years of running down-hill, he took an upward turn, and although he is not a well man to-day, he has changed from a condition in

which he could not perform the simple personal duties of dressing himself to a condition where he is doing a mile a day and working the punching-bag regularly. So, to positively determine these compounds is the first thing to be done; the next step is the therapeutic application to correct the fault. There is a characteristic form for each diathesis.

In reference to Dr. Gaylord, whose work I have known for a number of years, I have watched him and others who have been carrying out investigations along the same line, and I am waiting for these morbid growth men to run the germ theory of cancer out to a conclusion. Personally, I think they have done a lot of good work in proving that the germ theory of cancer causation is not right. With regard to the particular case referred to in my paper, he had been to three of the best specialists in Philadelphia, and they had all diagnosed the case as extreme ulcerative condition, or cancer of the stomach, with pyloric stenosis. This diagnosis had been agreed upon, and the man was to be operated upon within twenty-four hours for the removal of the growth. He was making lactic acid by wholesale, so much so that he told me if a forced evacuation of the stomach was brought about he paid for that by suffering for twenty-four hours with a scalded throat and naso-pharynx. Just imagine, if one attack of vomiting would cause that much irritation to the mucosa of the throat, what the chronic vibration to the gastric lining must have been! Do you wonder that he had a morbid growth? This lactic acid was, I believe, not due to fermentation or a peculiar condition in the stomach so that when he took carbohydrate foods in his stomach the lactic acid resulted from fermentation, but was unexcreted metabolic lactic acid due to disease of the liver. Physiology tells us that this is never excreted in the urine, and it was from the demonstrations of Minkowski that it was shown to be one of the functions of the liver to convert ammonium lactate into uric acid, which showed us that it was not the stomach that was at fault, but the liver. The liver is con-

stantly converting lactic acid into uric acid, and with the liver out of order this lactic acid was dammed back into the stomach. You could not expect to cure that man's stomach disorder while the liver was constantly pouring lactic acid into the stomach. As soon as you correct the liver, then the stomach will get well.

The practicality of this thing is in the light of what we already know of nutrition, and the appearance of these salts becomes not only diagnostic but pathognomonic of certain conditions. It is just as simple as if you find chunks of glass cementing the cinders together in your furnace; you know that some fellow has thrown a whiskey bottle into the coal bin. We study the ashes of nutrition, and when we find a particular kind of ash it is diagnostic of certain conditions.

With regard to the question of promotion of this research, I am sincerely and honestly anxious to get this method

or line of study planted in as many places as possible. I want to see it spread. Dr. Jarvie stated that we have been accustomed to referring these dental cases with constitutional conditions to the physician—I was so once myself; but you might as well refer them to the piano-tuner, because the physician knows nothing about them, and I am spending my time now in trying to get a little light thrown on the subject. Just as Dr. Butler said, we want to study the normal conditions of nutrition, and when we have improved this lowered vitality, or can prevent it, infection becomes impossible. Healthy men will not succumb to the attacks of these bacteria as do those individuals who have the nutritional function disturbed. Let us go back to the seat of these troubles and find out what is the matter, correct it and keep the nutritional function normal, and thus make good health contagious, instead of disease.

Adjourned.

IOWA STATE DENTAL SOCIETY.

Thirty-ninth Annual Meeting.

(Continued from page 731.)

THE next item on the program was a paper by Dr. S. R. HOLDEN of Duluth, Minn., of which an abstract follows:

THE NECESSITY FOR THE REMOVAL OF ALL SOFT DECAY IN PREPARING CAVITIES IN THE HUMAN TEETH FOR FILLING.

Many times, as is only too plainly apparent, fillings are made in the cavities of teeth where more or less soft or leathery decay is allowed to remain, presumably with the idea that it will afford protection to the pulp, thereby saving time and trouble which would necessarily be entailed were it to be removed, with the resulting exposure of the pulp. This

practice is seemingly pernicious when a clearly defined knowledge is attained of what this retention of softened masses of dentin really means.

In the very beginning the question should be asked, Why do we make fillings? What is our object? The answer is, To prolong the life and usefulness of the human teeth. If a surgeon be called upon to exercise and to give evidence of his skill in his art, does he with the idea of prolonging life allow one-third or two-thirds of the diseased tissue to remain? Does he close the wound as the completion of the operation with the tissues in this condition? He knows that by so doing he would counte-

nance and invite further progress of the disease to the detriment of health, if not to the endangering of life itself. We all know that intelligent surgeons do not so operate. The surgeon realizes that it is his duty to restore to health, and if possible prolong the life of his patient, otherwise there is no call for his services or reason for his being. The selfsame thing can be said of dentists and their operations. Whatever is to be done is to be done well or its doing is of no avail.

Broadly speaking, the physiological condition is the condition of health, the pathological condition the condition of disease, and between these two conditions there is unrelenting warfare. If we are to save, why lend so willing and effective a hand to that which we have sworn and are in duty bound to prevent. If it be because of lack of knowledge, it is time we were up and doing. If because of indifference, a resolute determination to interest ourselves to a degree sufficient to be in keeping with the present knowledge of these subjects is most essential. A man possessed of this knowledge, with a fixedness of purpose to profit thereby, is the superior, while he of persistent indifference and ignorance is the inferior, of the kind who is always and forever falling short of the mark of that which he could accomplish were he to will it.

It is not determinable there is any gain or virtue in leaving soft decay and covering it with a filling, either as to time, comfort, general usefulness of the member so treated, reputation, money remuneration, or a self-conscious satisfaction of a duty well done. Even though we operate alone, with no witnesses about, we are to give to those to whose wants we administer the best there is within us, it being their due, and exactly that we would insist upon and ask in return. To this fallacy—for so must it be denominated—of the desirability of the retention of soft decay over which fillings are to be made, it is high time to give constant and sturdy battle; and we may then rest with the assurance that success will be our possession because of the removal of all soft decay in each and every instance.

With some the assertion is being repeatedly made, and with wordy insistence, that decayed dentin can and does become recalcified under fillings. Careful notice is to be taken, however, that explanations of any character as to *how* these phenomena are brought about are lacking. This lack of explanation has been and is constant; and as a matter of fact it can be demonstrated beyond peradventure by reason, clinical experience, and chemical analysis, that such does not and cannot take place under such conditions. The position of those who are opposed to this reasoning is founded upon pure assumption. We might as well attempt to restore a decayed apple to a state of soundness, to restore its structure and vitality by the application of liberal amounts of carbolic acid or any other drug or chemical, as to attempt to restore the structure and function of masses of decayed dentin through the application of agents of whatever character which have the power to destroy germ life. The one idea is as tenable as the other, and neither can be substantiated. Take an orange or other fruit in which are found conditions of decay, is it eaten or rejected? It is rejected because it is decomposing. Oftentimes we have bitten into an orange in which the signs of decay are slight, only to find its entire substance involved or tainted, and in consequence it was thrown away, it being realized that it was impregnated with the poison of decay, and degenerating by it. As to dentin the principle is the same as with fruit substance; the tooth is degenerating because of the presence of the poisons of bacterial decay. How in the name of all that is fair can we expect to retain the vitality of a tooth in the presence of such conditions under a mass of filling material? The proposition is not reasonable on the face of it. The pulp sooner or later will be involved, with the resulting train of evils.

Now, if we are to get hold of this subject in a sane and intelligent manner, first of all it will be necessary to get together and come to a thorough realization and appreciation of what these mi-

cro-organisms are. For one thing it is realized they are indefatigable workers—which is a point in their favor, and well worth emulating! These micro-organisms are little cells of albumin possessed of physical properties and peculiarities much the same as human beings. They are accorded the same laws of nature, come into being, live, multiply, and die in much the same manner. When the human being is deprived of its natural surroundings, its natural and necessary environment necessary to the sustenance of life, it dies. As a consequence the elements entering into and making up its composition are liberated through the process of decomposition, and revert to their original state. So it is with the micro-organisms that are responsible for the destruction of tooth-substance. If they are deprived of that which is necessary to their life and growth, such as air, moisture, etc., they die, decomposition naturally follows, and poisons are generated. If a mass of softened germ-infected dentin be saturated with a poisonous drug or chemical, and sealed to the exclusion of moisture and air by means of a filling, that has been done which will cause the death of these micro-organisms, and it also means that the death of the pulp will very likely follow the death of the tooth. All this because of a notion that recalcification of the decalcified dentin will take place! It is comforting as a theory, but distressing when considered as a fact.

Decomposition of animal or organic matter means a poison, as all clearly recognize; at least it is noticeable that careful precautionary measures are adopted in the holding of autopsies to prevent abrasion of the skin, or wounds on the hands, numbers having paid the penalty of carelessness at such times with their lives. The poison generated by the death and decomposition of these micro-organisms is as capable of destroying life as any other poison.

It is to be observed and remembered that nothing whatever in the nature of proof of the statement that decayed and softened masses of dentin under the conditions described become recal-

cified has ever been given. On the contrary, when the statement is made that bacteria, when robbed of their natural environment, die, decompose, this decomposition forming a poison which in turn destroys the life of the pulp, it can always be found to be true.

The older idea, according to which nature itself was an unstable problem—the idea that no man could ever unfold the mystery of the universe—is passing away, and there is the beginning of an insight, imperfect though it be at present, in many directions. Research is tending strongly to show that we may hope in the end to know the actual logic of cause and effect. But it is noticeable that there are men of accredited wisdom, who in defiance of this increase of knowledge of a keener appreciation of cause and effect, solemnly declare that a mass of softened dentin, decalcified, full of germ life that has destroyed its structure and function, may by the use of agents and materials that are known throughout the world as poisonous, be recalcified and restored to its original or normal condition. We are almost persuaded to treat this statement with contempt, and it is indeed to be regretted that it must be held up to the scorn of any and all who reason and know for themselves the truths of nature. Yet is it to be told how this recalcification is induced—how a poison acting on and destroying this germ life, thereby creating another poison, has any physiological power to restore life and health! Yet this position seems to be taken by some men; and it is certainly a difficult matter to realize wherein such ideas have any reason, and it is still more difficult to ascribe those doctrines to the mind of thought and investigation. Be it said that the laws of nature are the laws of reason, of sanity, of truth, while the laws of man are many times, on the contrary, the laws of conceited sophistry, unjustifiable, and spurned by reason.

In closing let me say that a sharp and distinct line is to be drawn between this soft leathery decay and the hard flint-like discoloration of the dentin which we often observe. It is a fact as demonstrated by our clinical experience that

the latter variety producing in many teeth discoloration to a very marked degree seems to serve as a protective covering to a pulp, and is usually found immediately over it. It can be easily demonstrated that the pulp under ordinary conditions in the presence of this discoloration will be found to be alive and in a state of health. From our observations it would hardly seem permissible that we remove this discolored or flint-like dentin, as it is possessed of little sensitivity comparatively, and assists in the prevention of thermal shock. We all note the marked difference between the cavity walls of soft decay and the cavity walls of this hard discoloration as to their sensitiveness under instrumentation. It not only assists in the prevention of shock through changes of temperature, but also affords a safe and solid foundation upon which to make a filling. Its retention is to be urged looking to the future comfort and well-being of the tooth. It is as true that it is not safe to leave soft decay in the cavity of a tooth over which a filling is to be built as it is true that the hard variety of discoloration may be retained with a perfect degree of safety; and it is truth we seek as a finality.

Discussion.

Dr. MOYER. I feel that I have had altogether too much to say, and had no idea I was to be called upon to open this discussion. It is a subject in which we are all, it seems to me, in hearty sympathy. In all the dental meetings I have attended I have not heard of anyone that had the audacity to favor the method of leaving decay in the cavity in filling; but when we get to a place of this kind we have got to act, the whys and wherefores of it notwithstanding. I like to hear discussion in which there is argument on both sides; but these cases in which there is little to say in argument leaves one no opportunity for talking. So I can do nothing but indorse all the sentiments the essayist has given on this subject.

Dr. MADISON. I do not want to provoke a discussion, but while I am glad to

hear the remarks, I do not like to hear decaying apples or any decayed vegetable matter compared with diseased tooth tissue. I think there is quite a difference in the two; and we all know, also, that while recalcification does not take place, yet that decalcified dentin protected from moisture will become hardened. For instance, take a tooth and put it in acid, and it becomes decalcified and soft; put it where it is dry and it will become very hard again. And take a temporary tooth: I think it a very good idea sometimes to leave some of the leathery decay over the pulp, rather than expose it. I would not leave any around the margin; but I do not believe in removing all the leathery decay if there is danger of exposing the pulp.

Dr. WEDELSTAEDT. May I ask, Do I understand you to say that you do not believe in removing leathery decay to expose the pulp?

Dr. MADISON. I mean that I would not, especially in a temporary tooth.

Dr. WEDELSTAEDT. Will the gentleman kindly explain to us what the difference is between decaying teeth, whether a child's or adult's? I should like to have a little instruction as to what the difference between decay and decay is? The question is asked in all kindness.

Dr. MADISON. Take, for instance, the decay of fruit. A little while ago you laid down the rule to cut away all the tissue that was liable to decay or in the area of liability. Where is the area of liability in an orange? Take an orange that has commenced decaying, you may cut away all the particles in which there is danger of decay and put it away and decay will go on just the same; it will not do so in teeth where you cover it up with a filling. Unfilled teeth will last without decay for a long time if decay is removed—a smooth surface is left. Decay goes on differently in an orange from what it does in tissue or teeth or bone substance.

Dr. WEDELSTAEDT. As I am to blame for the discussion getting into this channel, permit me to say that I often temporize with little children, especially when a child is brought to me in a con-

dition of pain and the poor little thing very greatly frightened. In dealing with a child in this condition I very often make some sort of a temporary filling and then send the child away. But as soon as I have gained that child's confidence that temporary filling is removed and the cavity in the tooth prepared and filled as thoroughly as I can make the operation. I do not at any time believe in increasing the condition of pain that a child may be in, and I have never abused the confidence of any child. We know exactly what takes place where teeth are filled on a mass of soft decay, and no man of intelligence in this day of enlightenment does a thing of this kind except as a temporary expedient as in the case just mentioned. If we fill a cavity in any tooth without removing the

soft decay, it is but a question of time before that tooth is degenerated, and it is also but a question of time before there is trouble. But why say anything more about this subject? Was it not discussed at the last year's meeting and was it not settled?

I am very sorry that I must take exception to the remark of the last gentleman about the cause of the decay of the orange. I do not in the least agree with his solution of the case. I do not think that he would have to seek very far to find what was the cause for the disintegration of the orange. Decay is decay whether it takes place in teeth or in fruit, and if left to itself it generally ends in destroying that which it started out to destroy.

Adjourned.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

Regular Monthly Meeting, May 1903.

A REGULAR meeting of the Central Dental Association of Northern New Jersey was held at Achtelstetter's, Newark, on Monday evening, May 18, 1903.

President Fisher called the meeting to order. Some preliminary business was transacted, and the president then introduced Dr. HERBERT L. WHEELER, New York city, who read the following paper:

TREATMENT OF PUTRESCENT PULPS AND FILLING ROOT-CANALS.

In speaking upon the above subject this evening I am not unmindful of the remarks of my friend and teacher, Dr. J. Foster Flagg, made several years ago at a meeting of your State Society, in which he said that there had not been a new idea advanced on the subject of root-canal treatment for twenty years. While this may have been correct at the time it was uttered, it would scarcely be so

considered now. Within a very short time that *bête noire* of treatment, the unopened putrescent canal, has, through the introduction of formic aldehyd, become as readily amenable to our curative efforts as the fistulous opening is to carbolic acid. There may be, and without doubt will be, other medicines produced that are as efficacious as formalin in germicidal and deodorizing qualities, and they may prove as well fitted for the peculiar requirements of tooth-canal treatment as this remedy; but, with the exception of iodoform or its related compounds, all of which were uncertain in results or disagreeable to the sense of smell, formalin was the first remedy that could be applied to a newly opened putrescent canal with a reasonable certainty that disinfection could be accomplished without the painful process of acute inflammation so often occurring at

the apical end of the root, followed by congestion, breaking down of the tissues, and pus, forming an abscess.

About thirty years ago Mr. James Salter, F.R.S., said in his work upon Dental Pathology: "Often it is undesirable to extract a particular tooth that may be threatening or causing an abscess, and in that case recourse should be had to leeching the gums freely, the administration of brisk purgatives, and abundant hot fomentations of the face at the swelling part. . . . After pus has formed, in a very great majority of cases it remains in the form of a pus-discharging fistula, though I am confident, contrary to the general published opinion, that in a few exceptional cases the disease ceases altogether, the offending tooth still remaining in the mouth."

I quote the above to call attention to the advantage of general treatment, which we as specialists are quite inclined to ignore. Ofttimes, when a putrescent condition of the pulp-canal contents has induced an acute inflammation, general systemic treatment is the quickest and surest way of alleviating the pain preparatory to the operation of opening, disinfecting, and filling.

The early method of preserving the teeth after the root-canals had become putrescent was to saturate with the essential oils, such as cloves, eugenol, etc., or the phenyl alcohols, creasote, and that most useful remedy, carbolic acid—still the chief support in cases of fistula.

As far as I know, where a putrescent pulp without fistula presents itself, it has long been the established custom to leave the cavity open for vent, for a longer or shorter period.

My experience with the first remedy I shall describe to-night is that in nearly or quite all cases the cavity can be hermetically sealed at once, and by a judicious change of the dressing for a few times there will probably be a complete avoidance of the usual inflammatory and sensitive conditions so common in the past.

Formalin, which is the proprietary name of a forty per cent. solution of formic aldehyd gas (CH_2O) in water,

was first brought to my attention by the gentleman with whom I am associated, Dr. J. Morgan Howe. The gas is one which can be readily prepared in several ways, one of which is by burning in the incandescent state platinized asbestos over methyl alcohol (CH_4O), whereupon the alcohol is split up into formic aldehyd (CH_2O and H_2O). This gas is a very powerful germicide and very penetrating; is readily absorbed by water, hence it is prepared for medicinal use in an aqueous solution containing forty per cent. of the gas. This can be diluted until we have any strength we may desire. For our purposes a solution of two and one-half per cent. to five per cent. is strong enough, and with this care must be exercised not to get it upon the living tissue, as it often causes severe pain, though it does not leave an eschar.

My custom is, after opening into the putrescent chamber, to remove a little of the decomposing debris and wash out carefully with a solution of formalin, repeating this operation several times until the chamber is nearly or quite deodorized, but being very cautious not to in any way force any of the decomposed pulp through the apical foramen. The cavity is then dressed with the solution in such a way as to saturate it as much as possible with the medicine, a filling of temporary stopping is inserted, and the patient is dismissed until next day.

Even when I suspect pus at the end of the root, and contemplate eventually pumping carbolic through there, I prefer to begin treatment with this material in order to sterilize the contents of the canal before attempting to pump medicine through the apical foramen. It is my belief that if a two and one-half or five per cent. solution of formalin be left in a canal long enough, changing occasionally to make sure it has not lost its virtue, it will sterilize to the ends of the dentinal tubules. It seems to me that, if these tubes are one ten-thousandth of an inch in diameter, the bacilli of putrefaction, which may be but one-twenty-five thousandth of an inch in diameter, can penetrate readily, thus breaking down and changing the cellular construc-

tion of the contents, be it protoplasm or fiber; and that a gaseous disinfectant will penetrate all the parts of a tooth much more rapidly and surely than a liquid—though carbolic acid, which is supposed to limit its own operations by its coagulating properties, it is asserted by men of conservative and careful statement, penetrates completely through the dentin to the cementum in a devitalized tooth.

For all cases of putrescent condition of the pulp-chamber or canal where there is not certainty of an alveolar abscess, I believe formalin to be the most certain and sure in its effect and the quickest in its results, and it is usually the only remedy needed. Even when pus has formed at the apical end of the tooth it may be well to begin with this remedy, but never force it through the foramen, as it causes severe pain, besides setting up an acute inflammation. For this purpose I prefer carbolic acid, whether there is a fistulous opening or not.

I do not pretend to know the *modus operandi* of this germicide in the tooth-canal, nor do I find it published anywhere. Nearly or quite all remedies used by us in canal treatment are treated by the Solons of our specialty as those which coagulate albumin and those which do not. What the coagulation of albumin has to do with a root-canal filled with a putrescent mass of ammonia, hydrogen sulfid, and the other aromatic and fatty products of decomposition, is more than I claim to know; and what the effect of the different remedies advocated is upon these products of decomposed proteids is something I do not remember to have been stated by any author whose works I have read. Dr. Howe called my attention to the fact that in public discussion he has spoken of the chemical change in pulp-decomposition, showing that albumin is not present.

Having used for years cloves, eugenol, cinnamon, cassia, campho-phénique and other phenol mixtures, and having found them all decidedly wanting, it has been a great pleasure and relief to me to find a thoroughly good disinfectant and deodorizer that in a very great majority of

cases gives prompt relief and permanent results. Besides those cases of unopened canal that are often so annoying, cases where the tooth has been treated, the canal filled, and trouble has recurred have, after removal of the canal filling, responded readily to treatment with formalin.

As a general rule, all cases where there is not a well-formed pus cavity or fistulous opening can be treated successfully with this remedy in a two to five per cent. solution.

Before going on to the treatment of abscesses and fistulæ, I wish to mention a new product made by Parke, Davis & Co., and sold under the name of "Acetozone." This is an organic dioxid, and, upon its coming in contact with water or other moisture, a slow hydrolysis takes place, in which the chemical molecules are broken up and rearranged, forming, it is claimed, a powerful and non-toxic germicide. My own experience with the remedy is somewhat limited, but I will speak of two cases that interested me, and which produced good results. In one, the roots had long been filled with cement, and the irritation at the end of the root was constant and unremitting. After no little trouble the filling was thoroughly removed and numerous remedies tried, including formalin, with negative results. Two applications of acetozone permanently removed the trouble. In the other case someone had endeavored to fill the canals with gold, and had succeeded about as well as most cases of that kind at whose funerals I have officiated. This tooth had also given continuous trouble since its canals were permanently filled with gold. Upon applying the acetozone I noted that the cotton was badly discolored after twenty-four hours, and some little probing around removed the end of a steel instrument which the end of the root had been filled with—doubtless for the purpose of keeping moisture from the gold. After the apparent recovery of this case trouble recurred, which was quieted by two applications of formalin.

For abscesses, carbolic acid pumped into the cavity once or twice will most

always bring about healthy granulation of the soft tissues, and healing also in fistulæ, though in obstinate cases of the latter I sometimes resort to zinc chlorid. In attempting to pump medicaments through a canal I rarely use a syringe, but take a small piece of vulcanized rubber such as plates are made of, and use this as a piston, taking as little of the medicament as is compatible with getting results.

In connection with the subject of this paper I would like to call attention to the fact that the assurance that a remedy is a germicide is no guarantee of its value as a medicament for certain purposes. Formalin is a much more powerful germicide than phenol, but it will not heal a fistula from a putrescent root-canal as readily, and will cause a great amount of discomfort and possibly make the matter worse if used for that purpose.

Before filling root-canals I usually enlarge them to a greater or less extent, as the case demands, using hand instruments exclusively for this purpose, and never using a canal instrument in the engine handpiece.

As a filling for root-canals of molars and bicuspid I prefer the hard gutta-percha (No. 7½) such as is used for fillings. With a warm spatula I roll the cones on my cement slab to about the size of the canal I desire to fill, approximating it by the size of the cotton I can insert on a broach. I then introduce enough eucalyptol or cajuput upon a cotton roll to wet the canal walls thoroughly, and, without warming, push the gutta-percha cone home by the aid of fine pluggers. In the incisors and canines I sometimes fill with oxychlorid or oxyphosphate, but the apical end of the root is invariably filled with gutta-percha.

Discussion.

Dr. BOGUE. Dr. Wheeler referred to some things which interested me very much. In the first place he spoke of a certain book (which is somewhat antiquated as he stated), and it brings to my attention the fact that when books are written by members of the dental profession which are valuable they are

immediately accepted as authority by the medical world. Miller's book has been thus accepted. Cryer's book is thus accepted to-day as is Miller's. As Dr. Wheeler states, Salter recommended hot fomentation. I hope we have all got beyond that; but it is not many weeks ago that a lady was brought near enough to death's door for me to feel alarmed, by hot fomentations in the case of an extracted lower third molar. It is scarcely a year since another one actually died from the same cause, and I think Dr. Wheeler could also relate one or two cases in his own practice. It may be desirable to talk up such cases and discuss them, and I certainly think it would be well to look into them. A very eminent surgeon, Dr. Morris, has said twice within my hearing, within a year, that there was no operation in minor surgery that was so fatal as operations for these cases of abscesses in the lower molars, especially in the case of third molars.

Returning to the subject of putrescent roots, I was very glad to hear Dr. Wheeler state that he never used an engine drilling instrument in the canal, but I was sorry to hear him say that he enlarged the root-canal, because it seems to me, if we can be certain we have everything cleared out from the root-canal and can then permanently fill it, that the smooth sides which nature has left in the interior of the root are more kindly to the passage of any filling material that you may please to put in than any surface we can make by our instruments.

With reference to formaldehyd, Mons. André and De Marion, a friend of his, devised a formula—composed, I think, of equal parts of forty per cent. formaldehyd and absolute alcohol, with half as much essence of geranium—two or three applications of which in any putrescent root would entirely remove unpleasant odors and entirely disinfect the root. The cleansing is a mere matter of mechanical labor. I have used this preparation considerably for the last two years, and have found it very useful. Its greatest drawback is that if used before carbolic acid is employed it is liable to produce the very results that Dr. Wheeler

has so graphically described, so that one would wish he hadn't used it. But by using carbolic acid first, and then, two or three minutes afterward, a very minute quantity of this preparation, leaving it for a little while in the root, the results are admirable indeed.

There is another thing I would like to add to Dr. Wheeler's remarks. A good many years ago Mr. C. Spence Bate of Plymouth, England, was appointed by the government as one of the naturalists selected to examine a portion of the cargo of the "Challenger," an exploring vessel sent out by the government. The "Challenger" brought back a great many barrels of fish which had been caught in various parts of the South Seas; she had been gone two years, and yet these fish which Mr. Bate examined seemed entirely fresh. It appeared that these fish as they were caught were placed in a barrel of glycerin, left there for a few minutes, then taken out and laid on shelves, and that was all that was done to preserve them. Glycerin preserved those fish for the entire two years of the journey. On learning that, it occurred to me that if glycerin would act so well on fish it might act equally well on the pulps of teeth, and from that day to this I have used it when I get my pulp-chambers clean, and it has served me most admirably. There was thymol in my glycerin, however; how much added effect that has as a preservative I do not know, but the glycerin I am sure was extremely useful, and I have had but very little trouble when once I have succeeded in filling the cleaned root, leaving the glycerol of thymol at the bottom.

Referring to the use of carbolic acid, and its action as a coagulant of albumin, the gentleman who has had the most to say on that subject is a little sensitive and I suppose we had better not mention him, and perhaps we had better not combat his views too earnestly; but I will venture to say that that same gentleman some years ago advocated a certain mouth-wash, of which he gave the constituents, as a cleansing wash. Amongst the constituents was tincture of myrrh. I had occasion to ask him the question,

before a couple of hundred dentists, whether I had understood him correctly to say that he used myrrh in that preparation as a detergent, and he replied that he did; I said that to the best of my knowledge myrrh was a gum soluble in alcohol but not in water, and if he did not believe it he could dip his finger in tincture of myrrh and then in water, and he would find that his finger was sticky. The gentleman did not like it at all; nor did he like the statement that a putrescent root had no albumin in it. I believe it is true, however, and I make my compliments to Dr. Howe, and through him to Dr. Wheeler, for calling attention to that point, which I think is admirable.

I think we all owe our thanks to Dr. Wheeler for his admirable paper.

Dr. A. R. EATON. I have had but very little experience in the use of formalin in putrescent root-canals. Some two or three months ago I had a case of a bicuspid which I treated in the ordinary way with carbolic acid, and every time I would stop it up it would get soft. I made a preparation of 1:200 formaldehyd and by treating the tooth itself with that I succeeded in making a successful case of it, filling it eventually very satisfactorily to myself. In other cases I have not been successful; why, I do not know.

Dr. WHEELER. That is a one-half of one per cent. solution. I think in some cases it would be better to have it a little stronger.

Dr. S. C. G. WATKINS. The subject of root-canals is one that I am and have been for a great many years very much interested in. I differ somewhat with many dentists in my treatment. I was very glad to hear Dr. Wheeler say that he drilled root-canals, unlike Dr. Bogue, but I was sorry to hear him say that he did not do it with the engine and in all cases. For twenty years I have drilled root-canals with the engine, every canal; I drill out every canal and remove all foreign matter, and go just as near to the end of it as I possibly can. We cannot always succeed in getting to the end, but we can prepare the canal with a drill so

that we can carry the filling much nearer the end than if we did not drill.

All canals are not even; they are not all cone-shaped; many canals are such shapes that I claim it is—I will not say impossible to fill them, but it is impossible for me to fill them, without drilling. I have not practiced dentistry long enough to learn how to fill a pulp-canal in many cases without drilling, and I think in my practice it would be very foolish for me to attempt it. But with the drill I can enter any canal that I can enter with the broach, and in most cases can drill as far as I could go with the broach without drilling. If I have gone as far as I can with the drill I then have a chance to still go a little farther with the broach around the curves, the crooked and tortuous places where it would be impossible to go with the drill, or to even go with the broach without first having drilled.

I have used formalin considerably for washing out the canals before they are thoroughly opened, and believe it is a good thing. All putrescent matter should be removed before drilling or before running broaches up very far, for fear of carrying something through the end and causing irritation; but you must also be very careful not to carry the formalin too far, as it is a great irritant.

There was one statement the essayist made in regard to opening the canal a little way at the first sitting, treating it with formalin, and then having the patient call the next day for further treatment, and so on, day after day. The matter of frequent treatment is something that I have always been very much opposed to. I believe that nature should be allowed to do a great deal, and if we do our part early in the race, nature will do the rest. In a great majority of cases—yes, I may say in almost every case—the canal should be opened and cleaned thoroughly at the first sitting; pure carbolic acid should be pumped right through the canal, if such a thing be possible, into the abscess or into the fistula as the case may be, and enough to do its work; the canal stopped up with a rope of cotton dipped in carbolic acid

and xeroform, and the cavity filled with gutta-percha, and allowed to go for a week or ten days, or two weeks, or two months, as the case may be. Then, when the patient comes in, it should be filled up permanently. I do not like the practice of treating canals frequently; I do not think it is good practice in a very great majority of the cases. In ninety-nine per cent. of the cases, one sitting should be all that is required.

As to pumping medicine into the canal, my method has been for twenty years or more to use a square or four-sided broach, such as is used by jewelers for drilling holes in which to place jewels in watches and that kind of thing. By drawing the temper thoroughly you can do with those broaches whatever you desire in the canal without fear of breaking them; you can tie a knot in them—do anything with them. Take one of those broaches and twist a fiber of cotton on, and it will remain there; place it in the canal after it is drilled and you can pump the medicines in to your heart's content and know that you get them in. If you simply place some medicine in a canal which has not been drilled, in a small tortuous opening, and attempt to force it up by pressing rubber or something of that kind on it, and force that for three-fourths of an inch, it is almost impossible to do it; but where I put the broach up with a fiber of cotton wound around it tightly, and then pump, I know I get it up there; there is no guesswork about it. Of course, if it requires other treatment, as in rare, difficult cases, the patient comes back and gets a similar treatment. But when it is well I fill it with gutta-percha cones—first with this same broach with a fiber of cotton twisted around it, dipped in gutta-percha dissolved in eucalyptus; and then pump the gutta-percha and eucalyptus into the canal, and without removing that, carry the cone up through it, and in that way carry the dissolved gutta-percha into the little places which the cone itself would not fit and fill. Then, as an “ounce of prevention,” for fear there might possibly be some irri-

tation, I paint the gum with tincture of aconite and iodine.

Dr. HERBERT S. SUTPHEN. I have had very little experience in the use of formalin, but several years ago, when it first appeared, I used it a number of times, but, perhaps through faulty manipulation, did not get quite the results which it is capable of giving. Since then I have abandoned its use almost entirely, but after the very lucid explanation of to-night I shall use it as has been advocated by the essayist.

In my treatment of root-canals I have stuck pretty closely to the old-fashioned methods, with the exception that I never use carbolic acid. I was imbued with the idea in my early practice that carbolic acid coagulated albumin, therefore have not used it, and I have succeeded very well without it, and see no special reason why I should take it up at this time.

My method is at the first application to clean out as carefully as possible the root-canal with a fifty per cent. solution of sulfuric acid, being careful of course that none of the débris is pumped beyond the apical foramen to cause trouble and set up an abscess. After that is washed out with a saturated solution of soda bicarbonate and very thoroughly dried with hot air, I apply my medicinal solution, which is either iodoform dissolved in ether, or xeroform dipped in tricresol. I have used the latter for several years with marked success, and in many cases prefer it to ether or iodoform. I find, however, that one application is not sufficient, although I do not believe in too many; in an ordinary case two or three are usually necessary to bring the root-canal into perfect aseptic condition. As a rule, after the first application, unless I am very sure of the condition I do not stop the tooth thoroughly, but if any soreness or pain results I do stop the cavity with temporary stopping, considering it very much tighter than gutta-percha stopping alone. Then, if after two applications there has been no pain and the cotton be removed in a sweet condition, I fill the root-canal, using, as a rule, chloroform in which gutta-percha has been dissolved, and after drying that

I insert a gutta-percha cone, or two, as the case may be, in order to perfectly fill the root-canal, and then proceed in any way that seems indicated.

In that way I have had success. Of course, as we all of us know, occasionally in after years trouble will ensue; if it does, the root-canal is easily cleared of its filling and treatment is applied in the same way as under the first conditions. In cases where there is a fistulous opening, I attempt of course to pump the medicine through the fistulous opening if it be possible, and then proceed in the ordinary manner.

I desire to thank Dr. Wheeler very much for the very excellent paper he has given us to-night. It is an old subject, but one with which we have to deal every day of our lives, and although some of us may think it is a hackneyed thing, it is a thing which is never old, one that we always need. Any methods that can be given us that are new, or in the line of advancement, should meet with our most hearty sympathy and approval. The paper presented to-night shows a definite advance in the ordinary method of root-treatment, and I desire to thank the essayist most heartily for the excellent way in which he has presented the subject.

Dr. OSCAR ADELBERG. I coincide with the views of the last speaker with regard to our obligations to Dr. Wheeler, although I had not the pleasure of hearing the entire paper.

I am not going to give a dissertation upon *my* views, and *my* practice and *my* experience in treating root-canals.

While this is a hackneyed subject, still I appreciate the importance of it. We have from time immemorial been striving to get at the best method of treating the root-canals, and yet we are about as far from excellence as we have ever been. While Dr. Wheeler's paper gives some very lucid ideas and valuable instructions in the matter, I wish to sound a note of warning to the younger members here in regard to various observations of "How I do this" or "How I do that." Some men can do a certain thing very successfully, while another man may attempt to do the same thing, in the same

way, and with the same instruments, but make a dismal failure of it. When I hear men talking to the galleries and speaking of nine hundred and ninety-nine per cent.—no, excuse me, ninety-nine per cent.—of success in a certain matter, I always have my doubts of—not the veracity of the gentleman speaking, but I think sometimes he is carried away with his subject. I only desire to warn the younger members of the profession here not to take too much for granted, and to believe that there are some tortuous root-canals that they cannot enter with a broach, much less with a drill—unless we can procure drills that we can twist like a ram's horn or something of that kind. I have had quite a number of root-canals that I could not get into. I would not want to say what percentage, but I do want to sound just a note of warning, and counsel you to treat your root-canals on straight lines, as they are laid before you, to the best of your ability. Glean the best from all you hear, but do not take everything for granted, and do not think you can do what any other man can, for one man can do what another man cannot.

Dr. JOSEPH KUSSY. As one of the younger members of the profession I desire to refer to a somewhat peculiar experience which I had in the filling of a lower bicuspid. It has been my custom almost exclusively heretofore to use zinc oxychlorid in filling lower teeth, believing that gravity will assist me in completely filling the canal with the oxychlorid. In the present case, after the filling had been inserted, and the very next day and for several days thereafter there was an acute pericementitis, severe pain and irritation. I was confident the root-canal had been in an aseptic condition, and the canal was entirely filled. I determined to let matters take their course and I was not surprised when a day or two later the patient returned and said the tooth was perfectly comfortable. I attributed the inflammation to the irritating action of the zinc oxychlorid and I believe some of the filling material penetrated the apical foramen. I should think where formalin is

used in lower teeth the action of gravity would be conducive to forcing the formalin to the apical foramen, and thus producing an acute inflammation in many cases, and I would like to ask the essayist if it is his custom to use the same strength in lower teeth as in the upper.

Dr. WHEELER. Yes; you do not get gravitation, doctor, you get capillary attraction, in both cases.

In closing the discussion, I would thank you all, gentlemen, for the kind words you have given me.

My friend Dr. Bogue objects to hot fomentations, and tells about patients who used them becoming subjects for the undertaker. I would like to ask him if he thinks the hot fomentations sent them to the undertaker, or if he thinks it was because of infection of some kind from putrescent canals or through extraction? One case that he speaks of was that of a young physician, where I decided it was wise to have the lower third molar extracted. I sent him to a specialist in New York, where the crown of the tooth was extracted. Inflammation having set in and become very severe, I went with him to another, and finally got him to extract it. Trouble started immediately, and in forty-eight hours we had the patient in the hospital; a throat specialist was called in and we worked together. We had to keep the patient in a sitting position, with the head bent forward in order to avoid the dripping, from a catarrhal state brought on by the inflammatory condition around the throat, from falling into the trachea. The patient was in the hospital for six weeks altogether. In about three weeks, after careful work by the throat specialist, it was found that the root of the tooth had gone in the soft tissue inside the angle of the lower maxillary bone. The trouble did not come from hot fomentations, but from a very severe case of infection from the roots of a diseased tooth. Where do your hot fomentations affect that, Dr. Bogue?

Dr. BOGUE. Infection produced by the roots of the diseased tooth is conducted for a very much greater distance; the tissues are all loosened up and often-

times are apart, and in that particular locality which you speak of, the triangle of the lower jaw, it is not unusual to find such results taking place.

Dr. WHEELER. Thank you. We did not use hot fomentations in that case, but I wanted to find out whether you considered hot fomentations responsible for some of the fatal cases that have come to our notice.

Dr. BOGUE. I knew you didn't, Dr. Wheeler, but at the same time I wanted to draw you out!

Dr. WHEELER. Concerning the enlarging of root-canals, I said that I enlarged them more or less; I find some of them are so small that one of the small broaches Dr. Watkins speaks of will not go on. I always draw the temper of my broaches very carefully by putting them in a glass tube and holding the tube over a Bunsen burner until they become blue.

I do not see what the question of the smoothness of the root-canal has to do with it, because I use eucalyptol, which is an oil, and which I use for two purposes—first to facilitate the insertion of the gutta-percha cone, and then because it acts as a solvent on the outer surface of the cone; it is not so much of a solvent as chloroform, but still gives me the advantage I desire.

As to the question of adding geranium and alcohol to formalin, I see no reason why it should not be added, nor any reason why it should be. Formalin has a very pleasant odor in itself, and will—using the broaches as Dr. Watkins suggests, and cleaning out the root carefully—deodorize a very bad condition in a pulp-canal.

Dr. Bogue spoke of sterilizing the canal, but said nothing about sterilizing the dentinal tubuli. Formalin seems to have a very penetrating influence; that is why I like it. I think it has a greater action on the decomposed material in the tubuli than any other medicine I use. It is no better disinfectant than many other things—for instance, mercury bichlorid; but the trouble with the use of mercury bichlorid in a root-canal is that there are chemical conditions in the breaking down of tissues that may form

a combination that will render bichlorid inert, and in many cases the bichlorid may be just as useless as so much unsterilized water.

The action of formalin chemically I do not know, but I believe it has a chemical action when it comes in contact with the decomposed material, for I have found in very severe cases that the odor changes quite distinctly in the course of twenty-four hours, and after reapplying I can get rid of the disagreeable odor, although sometimes I have to apply it as often as six times. It seems to me there must be a chemical change which takes place there, and that finally enough formalin is introduced to do away with the evil conditions and thus overcome the undesirable odors. I can seldom do that, however, in one treatment.

Dr. WATKINS. Do you make a difference where you drill the canals from where you do not?

Dr. WHEELER. I have not. You did not hear all my paper, Dr. Watkins, and I think you were speaking from a somewhat different point of view. In treating an abscess at the end of the root, where there is no fistula, I use the same method as you do, I wind cotton on my broach, and pump the medicine through the end of the root, but where there is no abscess, or I believe there is none, I do not use that method. The reason I seal formalin in the chamber, and have the patient come back, is so as to be sure of sterilizing the contents of the canal before I take any chances of having any of that infected material go through the apical foramen.

I use the rubber only in fistulous openings; and in those cases I know I get results, because I can see the carbolic acid where it comes through. I never use it where there is not a fistula, because in those cases you find the air, or whatever gas was in the canal, and you cannot pump through it; it forms an efficient barrier which will not allow medicine to penetrate it.

I would like to ask Dr. Watkins what results he expects to obtain from painting the gum with aconite and iodin.

Dr. WATKINS. I think that many

times it may prevent an irritation by acting as a counter-irritant—prevent an irritation which you may cause with the instrument, and perhaps going through the foramen. I am always very much afraid of some such result, and do it as a matter of precaution.

Dr. WHEELER. Dr. Sutphen says that he does not use carbolic acid because of its effect as a coagulant of albumin, but that he does use a fifty per cent. solution of sulfuric acid. I want to ask Dr. Sutphen if he knows whether sulfuric acid coagulates albumin or not?

Dr. SUTPHEN. I have always understood it does not.

Dr. WHEELER. It may or may not; it generally does at first, but if there is enough of it used it redissolves it. But I have yet to see it proved that there is albumin in a canal that has been putrescent.

Dr. SUTPHEN. I notice that point.

Dr. WHEELER. Referring to the question asked by the gentleman (Dr. Kussy) concerning the use of zinc oxychlorid, I think probably his own explanation of the matter was correct. It is quite probable that the zinc chlorid, which is very penetrating, used in mixing the oxychlorid created an irritation. But it was not necessarily that, because oftentimes with a gutta-percha or with any other filling you may use, you will get that same condition, which will subside in the course of two or three days and give no further trouble. It is nothing to worry about, however, unless the tooth becomes increasingly sore and troublesome.

Concerning eucalyptus, I find it is quite common in the profession to speak of using it. Eucalyptus oil contains three oils, the best of which is eucalyptol; it is the best germicide, and also the superior solvent for gutta-percha. Of the other two oils, one is not a germicide, and the other is only comparatively so. Eucalyptol, which is the essential oil, is very much better.

There is another matter to which I desire to refer. You are strangers to me very largely, but I may say that I have not always lived in New York; I formerly practiced in a small city of about

120,000 inhabitants, and I have had a great many experiences, sometimes unfortunate and sometimes embarrassing, in attempting to get proper fees for the work of treating and caring for diseased teeth; and it has occurred to me that in many cases the members of our profession have not an adequate appreciation of the value of their time and skill in this work. My own experience has been, although I cannot say it is that of others, because we all differ in our personal characteristics, that it requires much more skill and patience, more painstaking time, a greater amount of study and knowledge, to be able to thoroughly and successfully treat root-canals, than it does to put in any kind of filling there is—and I think I have used all kinds, including porcelain, which is somewhat of a fad just now. I have striven very hard for many years past to insist upon a proper compensation for my time, and if I put in time to the extent of fifty dollars, I charged fifty dollars. I think that as professional men we ought to charge in proportion to the amount of labor and skill and time we put in the work. I find that unless one is very particular to explain to the patient, the latter is inclined to complain, and perhaps we are as much to blame for it as the patient; where one has successfully treated a root-canal, taken a great deal of time and charged the regular rate for it, the patient seems to think he has not received much service for the money, whereas you might have put in a filling that any "carpenter" in the profession might put in, and the patient would gladly pay a good price for it. I appeal to you as young men, which many of you here are, in the profession, to attempt as far as possible to educate the public to the value of teeth that have become diseased, and the worth of your skill and time exercised in preserving them.

Dr. BOGUE. May I ask a favor of yourself and the essayist, Mr. President, to add one little word? (The desired leave being accorded by the president and the essayist, Dr. Bogue proceeded as follows:) I was hoping that Dr. Wheeler would explain a little further

in regard to the use of this remedy, formaldehyd, with which he is more familiar than some of the rest of us. He did say—but it seems to have passed the attention of certain of the gentlemen who heard it—that formic aldehyd is a gas, that water will dissolve forty per cent. of it and no more; he further added that a five per cent. solution was about as strong as is generally wanted. Now, what happens when you put a five per cent. solution of formalin—as you may call it, because that is the commercial name of a certain product made by a certain house, or you may call it formaldehyd, because that is the scientific name of it, or, if you want to go into the particulars of it, you can call it formic aldehyd, which is the same thing—but what happens when you put that into the root of a putrescent tooth? Why, the gas is given off and it penetrates the dentinal tubuli, so far as we can learn. I do not know whether anyone has taken out teeth that have thus been treated in the mouth, and made a postmortem examination, but as far as I can learn that is what takes place. Is it not, Dr. Wheeler?

Dr. WHEELER. I believe so. I cannot find that anyone has taken up the subject of the putrescent substances in the dentinal tubuli and treated it from a scientific standpoint.

Dr. BOGUE. De Marion has gone into it somewhat, and so has André, and they are the ones who advocated the formula I had the pleasure of repeating this evening. They say they have never come across a putrescent tooth that could not be entirely cleared in three applications; but they make an application which lasts an hour. I think I have had no case in which the root was not cleared on the second visit; but unless I was careful in using it, the result has been as Dr. Wheeler described, which is not pleasant for the patient and sometimes is not at all pleasant for us. I remember my good old friend, Dr. Hurd, once on hearing one of his younger friends telling of *my* patients, and what *I* do for my patients, getting up and addressing the president and saying, "Mr. President, the gentleman has a good deal to say about *my*

patients, but, Mr. President, the gentleman forgets that the critters have legs and they use 'em."

A certain doctor told me, when I visited him in Baltimore shortly before his death, that his treatment of teeth by the Arthur method had been so eminently successful that his patients had nothing more for him to do. The fact was they had all left him!

Dr. SUTPHEN. Mr. President, may I have the privilege of saying a few words without the stenographer listening to it?

I was very glad to hear the last remark of Dr. Wheeler on the subject of fees. Throughout my professional career I have always had the idea that the treatment of teeth was one of the most important things we had to deal with. It takes time in our practice which patients do not appreciate. In the majority of cases patients have not been educated to the point where they can see the value which should be placed upon diseased teeth, nor have they been able to appreciate the difference between inserting a filling and cleaning a tooth. It made no difference according to their idea how long it took to do the work. In their eyes it was merely a filling, and in many instances they have objected to the fees which I have charged them for the work. I have tried as far as possible to educate them to the idea that if it took six or seven applications to treat a tooth, as it sometimes does, where a filling might be inserted in one, there is no reason why they should not pay for the six or seven applications instead of one. I have often heard people say "I have lost a certain tooth. I would rather have given a hundred dollars than lose it," but if you treat a similar tooth in their mouth, and save it, and then charge them ten or fifteen dollars for so doing, they are very apt to object; showing that their assertion regarding the value of their teeth was not worth the time it took to make it.

On motion a vote of thanks was extended to Dr. Wheeler for his very excellent paper.

On motion the meeting then adjourned.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

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PHILADELPHIA, OCTOBER 1903.

EDITORIAL DEPARTMENT.

A DANGEROUS FEATURE OF ARSENICAL PASTE.

WE have had brought to our notice during the past year several cases of loss of individual teeth with accompanying necrosis of the alveolar walls as the result of a mode of treatment which because of its dangerous character should be avoided. We take occasion, therefore, to here direct attention to the matter, believing it to be of sufficient importance to merit consideration by all conservative practitioners of dentistry.

The history of all of the cases is the same in their essential features: The patient presents for relief of odontalgia from an exposed pulp, an arsenical application is made, and later removed, but for various reasons the devitalized pulp is not extirpated—either from lack of time, inaccessibility, or because the operator deems it unnecessary; so an application of mummi-fying paste is made and the case dismissed with a temporary stopping—or, as in one case, with a permanent metallic filling. In a period varying from one to three weeks the patient returns with a history of continued dull throbbing pain, swelling and tumefaction of the tissues about the socket of the treated tooth, the pain extending deeply into the jaw; and in two instances the patient has returned to the dentist with the tooth removed, it having been dislodged by the fingers of the patient or fallen out as the result of the inflammatory process set up by the previous pulp-treatment. In one case the irritation to the deep tissues of the jaw continued for weeks after the tooth was exfoliated and the attendant pain

was a constant source of distress during the whole subsequent period of repair. An investigation of these cases reveals pretty clearly the nature of the disturbance, and points definitely to the danger of sealing permanently *in situ* these arsenicalized pulps, even when protected from putrefactive changes by so-called mummifying or tannifying pastes.

It has been shown by careful experimental research that when arsenous acid is applied to the dental pulp a considerable portion is absorbed by the proteid elements of the pulp tissue and by the hemoglobin of the vascular supply to the organ. These proteid compounds of arsenic are in relatively weak chemical combination, and in the course of a short time, if the poisoned pulp tissue be not promptly removed, the arsenic is liberated by the breaking down of its proteid combination first formed in the pulp, and is diffused throughout the structure of the root until it sets up an arsenical necrosis in the pericementum.

One of these privately reported cases was treated, after an arsenical application, with a mummifying paste in which formaldehyd solution of 40 per cent. was the excipient used to convert the other ingredients into a workable paste. It is possible that in this case the formaldehyd may have contributed to the loss of the tooth, but that it was directly responsible therefor is disproved by the fact that the same result has occurred when other mummifying pastes without formaldehyd have been used to seal in place an arsenicalized pulp. We must therefore attribute the result primarily to the retention of the arsenic-saturated pulp tissue, though it is highly probable that the ingredients of the mummifying pastes in general by virtue of their affinity for proteid matter, upon which their tanning property, or their power to bring about the fixation of animal tissue depends, contribute to the result by liberating the arsenic from its original proteid combination in the pulp, thus setting it free to diffuse itself throughout the tooth and to work out its destructive results upon the retentive tissues.

Arsenic as a pulp-devitalizing agent has served a valuable purpose in dentistry as a pain-relieving medicament, and it has undoubtedly been the means of enlarging the possibilities of conservative practice. It is equally true that its careless or injudicious use has caused the destruction of many teeth, and in not a few instances more or less extensive necrosis of the jaw structures. Greater knowledge of the properties of the drug has taught us a greater conservatism in its use. It is not many years ago that arsenical applications were made for the relief of hypersensitive dentin, until the sad experience of its tendency to devitalize pulps when so employed taught the wisdom of avoiding its use for that purpose. While we would not, with our present knowledge, take the ground that arsenous acid may not be safely used for pulp-devitalization, yet, considering on the one hand that it is a dangerous agent unless used with intelligence and caution, and on the other hand that strictly surgical methods of pulp-extirpa-

tion are now possible without pain under cocain anesthesia, it would seem that we are about at a point where the old and avowedly dangerous method of pulp-destruction by arsenical paste should be relegated to the lumber-room of abandoned methods of dental technique, and the safer and equally satisfactory modern methods of pulp-extirpation by surgical means be substituted as the accepted mode of practice.

THE FOURTH INTERNATIONAL CONGRESS.

WE are glad to be able to report that the work of organization of this great meeting is being pushed forward as rapidly as possible, and from all quarters we learn that the interest in its success is most enthusiastic. The several committees having in charge special features of the work are being rapidly completed as to their make-up, and are proceeding with their duties in a most satisfactory manner. It is important that all state and local dental societies should take official cognizance of the congress by the appointment of committees having power to co-operate with the Committee of Organization on behalf of the societies which they represent, and with whom the Committee of Organization or its sub-committees can officially communicate with a view to furthering the purposes of the congress. Whenever such action is taken by a state or local society it should be promptly reported in detail to the secretary of the Committee of Organization of the congress for record.

An important feature of the work is being rapidly arranged and will shortly be ready to put into active operation, viz, the registration of membership in the congress. The rules governing membership are inclusive of all reputable dental practitioners, and certificate blanks will, in the near future be placed in the hands of all of the state chairmen, so that they will be available to all who are entitled to membership and desire to avail themselves thereof. The congress committees of all state and local societies can greatly promote the success of the congress by securing the adhesion of local members and stimulating an interest in this movement in their societies.

The design for the souvenir bronze medal authorized by the Committee of Organization is completed, and is a unique work of art symbolic of the progress of dentistry and commemorative of the great meeting to be held at St. Louis in 1904. A description and illustration of the congress medal will be published by the dental journals at an early date.

A STEP TOWARD RECIPROCITY.

THE following resolution presented by Dr. C. S. Stockton has been passed by the New Jersey Board of Dental Examiners and by the National Association of Dental Examiners at its Asheville meeting, with the sug-

gestion that it serve as a practical basis of reciprocity in the interchange of dental licenses among the states where its provisions are not in conflict with the statutes governing the case. Two states—viz, Ohio and Indiana—have already entered into a reciprocity arrangement on this plan:

RESOLVED, That an interchange of license to practice dentistry be and is hereby recommended to be granted by the various state boards on the following specific conditions:

Any dentist who has been in legal practice for five years or more and is a reputable dentist of good moral character, and who is desirous of making a change of residence into another state, may apply to the examining board of the state in which he resides for a new certificate, which shall attest to his moral character and professional attainments; and said certificate, if granted, shall be deposited with the examining board of the state in which he proposes to reside, and the said board in exchange therefor may grant him a license allowing him to practice dentistry.

We are heartily in accord with the purpose of the resolution and should be glad to see it put into effective operation as broadly as possible. It is evident, however, that Dr. Stockton's resolution could only be utilized as a basis of reciprocity among those states in which the law grants discretionary powers to the Dental Board in the matter of determining the standard of professional acquirement. As there are a number of states where the board has just that power, there should be no difficulty in establishing reciprocity with states similarly situated. Where, however, the standard of professional attainment required in a state is definitely and specifically set forth in its dental statute the board necessarily has no discretionary power in the matter, and can establish interchange of licenses only with states having an equivalent standard fixed by law.

It is perhaps germane to the question to call attention to the fact that where the standard is specified in detail in the statute, it at once removes that standard from the possibility of political interference or personal bias, and the professional attainment demanded by the state remains the same regardless of the mutations which take place in the personnel of the board through revolutions of the political machinery of either the state or the state society.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.—CORRECTION: By a clerical oversight the name of CHARLES S. STOCKTON, D.D.S., was omitted from the Committee of Conference in the announcement of the officers of the N. A. D. E. published in our September issue. We regret the omission and gladly make the foregoing correction.

We have received for publication the following notice:

"ON account of the resignation of BURTON L. THORPE, D.D.S., president of this association, JAS. G. REID, D.D.S., of 1204 Trude Building, Chicago, Ill., will, from September 14th, assume the duties of the president.—CHAS. A. MEEKER, D.D.S., *Sec'y N. A. D. E.*"

REVIEW OF CURRENT DENTAL LITERATURE.

[*International Dental Journal*, August 1903.]

EXPANSION OF GUTTA-PERCHA. BY DR.

FRANK T. TAYLOR, BOSTON, MASS.

The value of the expansive action of gutta-percha is often overlooked. Most of us have seen teeth which contained gutta-percha under metal fillings and which had a weak side split off by the expansion of the capping. Advantage can be taken of this expansive quality of gutta-percha by using it to separate teeth.

In many cases more space is needed than is easily secured by wedges in the ordinary way. In such cases pack the pink base-plate gutta-percha into the cavity until it completely fills both the cavity and the space between the teeth, pressing firmly against the adjacent tooth, or filling both cavities, if there are two. This method is especially useful in cases where bicuspid and molars have moved together and space is required for properly contoured fillings.

The gutta-percha, by its slower expansion, secures the necessary space in a few months without soreness of the teeth or annoyance to the patient. The necessity of keeping the gutta-percha from crowding up into the gum, and of protecting the pulp from the pressure of the expansion where the dentin covering is thin, will be obvious.

[*Trans. Odontological Society of Gt. Britain*, London, May 1903.]

A CASE OF HEMOPHILIA TREATED BY CALCIUM CHLORID INTERNALLY AND ADRENALIN LOCALLY. BY MR. FRANK MORLEY.

S. D., aged ten and one-half years, was admitted to hospital on Friday, February 13th, bleeding profusely from the gum around the lower right second temporary molar, which was carious to the gum margin, and loose. Hemorrhage had been going on for three days and the child was weak, pale, and almost pulseless. He had always bled a great deal from the smallest scratch and suffered from epistaxis, which was difficult to control. His grandfather on the mother's side suffered from the same disease, and once "nearly died" from hemorrhage after tooth-extraction, thus following the rule that hemophilia attacks the males of a family, while the diathesis is

transmitted through the female line. The house surgeon packed pads of cotton wool soaked in adrenalin around the tooth, put the boy to bed, and gave him ice to suck. When Mr. Morley saw him the next morning, February 14th, the bleeding had practically stopped, but the initial cause remained, viz, the rough edge of the loose temporary molar scratching the adjoining gum. I therefore decided to take out the tooth, so I kept the boy in the hospital and gave him large doses of calcium chlorid. On the following Saturday I removed the tooth, and immediately applied cyanid gauze strips soaked in adrenalin with digital pressure. On removing these in ten minutes there was no sign of hemorrhage, and in a couple of days he was discharged. Mr. Wallis reported two cases of hemophilia treated successfully with calcium chlorid in the *Journal of the British Dental Association* last August, and experiments by Professor Wright of Netley have proved that it increases the coagulability of the blood. Adrenalin also has lately been largely used locally as a hemostatic. To which drug was the success of this case due?

[*Dental Era*, July 1903.]

SALVATION OF TEETH WHERE THE PULP IS INVOLVED. BY R. O. HIRSCHI, D.M.D., GUTHRIE, O. T.

The author in discussing the treatment of decay of tooth-structure which has progressed to such an extent as to involve the pulp, and which he justly regards as one of the chief difficulties with which the dentist has to contend, says that there is only one safe manner of procedure in teeth where the decay is so near to the pulp as to make it sensitive to thermal changes and chemical influences, and that is the devitalization and removal of the pulp. If the canals are in a healthy and aseptic condition they should be filled. Partial or entire exposure of pulp requires the same procedure. Pulp-capping and pulp-mummification are mostly used in such cases, and invariably result sooner or later—usually sooner—in one of these two conditions: either over-stimulation of the affected pulp, which will cause pulp-nodules, or the death of the pulp with the consequent trouble.

A putrescent canal with even the best possi-

ble access and cleaned out ever so well should not be filled at the same sitting. It may cause some trouble, and why take these chances? Pathogenic micro-organisms are bound to be lodged in the dentinal tubuli, and it would be difficult to destroy them thoroughly in one sitting. We must not forget that there is a direct connection between the pulp and the peridental membrane through the tubuli and canaliculi, and if they are not put in an antiseptic condition they may cause a disturbance of the pericementum. It may be but mild, and may be gradually absorbed, but it may also result in an aggravated pericementitis, neuralgia, or other pathological conditions.

[*Dental Era*, July 1903.]

THE INNERVATION OF THE TOOTH-PULP. BY DR. JOHAN RYGGE, DENTAL INSTITUTE, UNIV. CHRISTIANIA, NORWAY.

After reciting the results obtained by previous investigators, the author reports his own recent work upon the innervation of the dental pulp and the conclusions deduced from his studies. He says on several occasions it has been described that medullated nerve fibers united in bundles are found particularly in the center of the root-pulp, where they follow the vessels. The main ramification of the fibers occurs in the crown portion of the pulp, which is best seen in pulps of molars. From the center of the crown pulp the fibers ramify toward the periphery. Morgenstern distinguishes in the crown pulp two distinct fiber systems, viz, a central one and a parietal one; the latter runs parallel with and under the odontoblastic layer. This the author can verify, especially with the Golgi method.

That these parietal fibers are still medullated, the osmic acid slides will show. Contrary to other workers, Dr. Rygge has found that the Golgi method gives the best results as far as the human tooth-pulp is concerned. He has succeeded in tracing the nerve fibers in the pulp of human teeth by the Golgi method up to the very end of the odontoblastic layer, and further has been able to investigate somewhat closer their connection with the parietal fibers. He has tried to stain the pulps of human as well as of rabbits' teeth, using the vital methylene-blue method. According to the modification of this method by Dogiel and Landowsky, he succeeded in human teeth, especially in the root portion of the pulps, in obtaining a good stain of the nerves, but did not see any nerves in the odontoblastic layer.

Repeating Huber's experiments on rabbits, under deep ether anesthesia he dissected out both carotid arteries and injected a one per cent. solution of methylene blue (Grübler, rect., after Ehrlich) in 0.6 per cent. NaCl, and heated to 37° C. The amount of the injected liquid varied from 5 to 80 c.c. Twelve animals were injected. In most cases he succeeded in staining the pulps as well as the lips, gums, and palate. After the injection the animals were killed. In some cases the teeth were extracted at once, in other cases after half an hour. As Huber has rightly stated, the pulps of the lower molars stain much more easily than the upper ones. The teeth were split and the pulps carefully removed. He never succeeded in removing the entire layer of odontoblasts, as Huber states that he did. The pulp was then placed in 0.6 per cent. NaCl solution upon a slide and investigated under the microscope. Only in three out of the twelve cases did he succeed in staining the nerves; in the other cases the staining was diffuse. The odontoblasts were always stained deeper than the remaining pulp tissue. Whenever he thought he had reached the maximum of staining, he placed the pulps in a concentrated solution of acid picric acid of ammonia, later in Betha's solution, finally washing in water. The pulps were then quickly imbedded in celloidin and cut into thick sections (50 to 100 microns). In the tooth-pulp he was specially successful in staining the root portion, and occasionally the crown part. In the odontoblastic layer he did not see any nerve fibers, as Huber succeeded in doing. On the other hand, he has seen in these pulps, in various places, patches of precipitated stains in the shape of stars or fibers. The latter fibers could be followed up to the odontoblastic layer, but they were too thick to resemble nerve fibers.

In regard to the possible course of the nerve fibers in the dentin, he agrees with the statement which Römer has made, that the three most important methods of staining as proof of nerve fibers—the Golgi method, the gold chlorid stain, and the vital methylene-blue stain—are absolutely unreliable. All methods produce only granular precipitations, and it is impossible to differentiate between the walls and the contents, not to say anything about the making out of particularities in the contents. Even if it be the case that beside the special system of dentinal canals another system of canals does exist in the dentin, the black stains do not at all prove the existence of nerves. The black stains can be produced with the Golgi method in other canals, viz, in the fine bile-ducts of the liver. The Golgi

slides of Morgenstern pictured in the *Archiv für Anatomie und Physiologie*, 1896, do not, he believes, demonstrate the transgression of nerves of the pulp into the dentin, as the layer of odontoblasts is indifferent to the staining. According to his view, it is very questionable if the nerve fibers of the pulp enter into the dentinal canals.

In the human tooth-pulp it is possible to show, with Ramon y Cajal's modification of

the Golgi method, the entrance of some of the fibers of the parietal nerves of the coronal portion of the pulp into the layer of odontoblasts. The fibers may depart from the parietal fiber in an angle or loop-like fashion. Between the odontoblasts the single fibers divide themselves dichotomously. Most of them end in a fine point or divide into fine granules. Most likely the majority of them are to be looked upon as end branches.

PERISCOPE.

Tooth-Surfaces Susceptible to Caries.—

The gingival, buccal, and labial surfaces, by reason of their locations, are particularly vulnerable to caries. The extension of their margins should be such as will place them in zones that are not susceptible to carious processes as now understood.—CHAS. E. BENTLEY, *Dental Review*.

Depth of a Lower Plate.—It must always be borne in mind that a lower plate, full or partial, must not be so deep on the lingual side as to be lifted by the muscles and glands, which often rise above the top of the ridge. When preparing to make a plate always have the patient raise the tongue to the palate and act accordingly.—L. P. HASKELL, *Dental Summary*.

General Medical Library for the Dentist.

—The advantages to the dental specialist of a general medical library are many; in this age of specialists, where the line of duty has been so closely drawn, it is many times necessary for us to confer with the rhinologist, ophthalmologist, neurologist, gastrologist, or perhaps with the general practitioner, in regard to our patients.—ALICE M. STEVENS, *Internat. Dental Journal*.

How to Extract Broken-Down Roots of Bicuspid and Laterals.

—For extracting roots of lower bicuspid and upper laterals, where decay has extended to the process or beyond it, where the elevator could not be used, try a screw and you will be surprised at the result. Wash debris out of the root, drill slightly into the sound portion, following the canal; put in your screw tightly, then extract by grasping the screw with narrow-beaked root-forceps, giving a straight pull; do not luxate.—G. R. GARD, *Dental Summary*.

Soda for Sterilizing Root-Canals.—As a sterilizing agent in root-canals try a fifty per cent. solution of ordinary caustic soda, applying it just before filling the canal. Great care should be taken not to allow it to come in contact with the lips or gums, as it is a very powerful escharotic. No drying of the canal is necessary. Flush the cavity with alcohol, then with chloroform, and proceed to fill with chloro-percha or gutta-percha points.—G. CHISHOLM.

Quick Separation Contra-indicated in Teeth to be Filled with Amalgam.

—When amalgam is used, quick wedging is contra-indicated in any but small fillings. Unless the teeth are kept apart sufficiently long to overcome the tendency to immediately resume their normal position, any contouring will be destroyed; possibly, indeed, the filling may be broken up and disintegrated by the teeth springing together as soon as the wedge is removed.—D. LINLEY PALMER, *Dental Brief*.

X-Ray Treatment Useless in Actinomycosis.

—Heidingsfeld (*Cincinnati Lancet-Clinic*, March 28, 1903) describes the case of a farmer suffering from actinomycosis of the jaw. After the disease had existed for upward of a year a surgeon diagnosed it as cancer, and advised removal of the right half of the lower maxilla. Three months later this patient was exposed to the X-ray treatment for three months, twenty-five applications of the light being made in that time. The treatment was perfectly futile. After three months' rest the patient consulted a second X-ray specialist, who gave twenty applications in nine weeks with negative results. Iodin treatment, begun two years from the beginning of his trouble, was, however, followed by a marked improvement.—*Therapeutic Gazette*.

Don't Sacrifice the First Molar.—If, by any given grace or knowledge, the first permanent molar is successfully carried past the dangers of its early career, it is certainly not to be sacrificed later to any supposed purpose of making room. Careful observation will show that the opposite condition is the one created by such removal; the expanding power of the erupting force of incoming teeth is lost, to say nothing of the contraction in space following the loss of the roots to hold the right of way possessed.—L. ASHLEY FAUGHT, *Dental Summary*.

"Taking the Bite"—Significance of the Term.—"Taking the bite" is the commonly accepted but somewhat homely expression indicating the procedure incident to securing and reproducing the normal relation of the mandible to the upper jaw; and in the process of constructing artificial dentures there is probably no one detail which is more difficult to accomplish with certainty, one which is of more material importance, or upon which the success and serviceability of the work is more dependent, than this same procedure.—HART J. GOSLEE, *Dental Review*.

Pyrozone (H₂O₂) as a Mouth-Wash.—For diseased conditions of the mouth and gums from pyorrhea, calculus, abscesses, there is nothing superior to pyrozone as a cleansing agent, but it is not well to use it too freely in mouths containing bridge work, because the pyrozone will disintegrate the cement and cause the bridges to become loosened, requiring to be reset. Therefore, for cleansing bridges in the mouth, I recommend glyco-thymolin, formalid (Wampole's antiseptic solution), or some other convenient preparation.—G. CHISHOLM.

Amputation Under Cocain Anesthesia.—Another contribution to this subject is made by J. H. Gibbon (*Philadelphia Med. Journal*, May 2, 1903), who reports a case of painless amputation of the leg in a man of fifty years, who was suffering from far-advanced tuberculous disease of the ankle-joint and foot. The age and general condition precluded general anesthesia. Morphin, gr. $\frac{1}{4}$, and atropin, gr. $\frac{1}{150}$, were given hypodermically fifteen minutes before operation. The sciatic and anterior crural nerves were then exposed by the infiltration method of Schleich and injected with a one per cent. solution of cocain. The operation was done without pain or shock, at the middle third of the leg. The author calls particular attention to the infiltration for exposure of the nerves, and insists that the solution be pure and fresh and the technique perfect.—*Medical News*.

Poisoning with the Powerful Antiseptics.—Remember that mercury bichlorid, carbolic acid, and iodoform may cause systemic poisoning, even in the small amounts commonly employed for dressings. The sublimate gives rise to diarrhea with pain and a rising temperature; carbolic acid poisoning is attended by the well-known changes in the urine, sometimes with severe vomiting, lowered temperature, and collapse; while iodoform may cause collapse or a rise of temperature, with a feeble pulse, and delirium and drowsiness, particularly in children.—*Internat. Journ. of Surgery*.

Contracted Dental Arches.—In cases of contracted dental arches very frequently it is best to expand both upper and lower, and I have not found the wearing of two plates at once much objected to by the patients. I use split vulcanite plates with a piano-wire spring, and almost always make the plates cap the back teeth. I instruct the patients to wear them all night and as much during the day as they conveniently can. To make the plates clip in tightly it is very important to slightly cut into the lingual surfaces of the bicuspid and perhaps of the molars on the model before vulcanizing on it.—HARRY BALDWIN, *Brit. Dental Journal*.

Light Therapeutics.—Bie (*Wien. klin. Rundschau*, No. 37, p. 723) sums up as follows: (1) Finsen's treatment of smallpox with red light depends on the irritating action or chemical rays, and thus the prevention of pus-formation in the vesicles, of secondary fever, and of scars. (2) The red light treatment of other exanthemata has not been thoroughly tested. (3) The universal light-treatment of the future will probably be sun-baths or exposure to arc lamps of one hundred and fifty to two hundred ampères. At the present moment, however, too little is known of the general working of light to strictly lay down any definite indications. (4) The single method of light-treatment the success of which is firmly established is Finsen's method with concentrated chemical rays. The excellent cosmetic results are ascribed to the fact that the method is essentially preservative. Nothing is destroyed, no contraction of the tissues results, and the scars are smooth and white. The treatment is free from pain, and the results are excellent. Out of six hundred and forty patients only 1.7 per cent. had to give up treatment because of unfavorable results; eighty-five per cent. were favorable; only fifteen per cent. were unfavorable.—C. F. M., *Treatment*.

Treatment of Cavities Previous to Filling.—After a cavity is prepared in the usual manner I thoroughly saturate it with cologne—alcohol may be used instead if preferred—mop out the surplus with cotton wool, and by means of a chip-syringe thoroughly dry the cavity. When dry, and before any moisture can again enter it, wipe out with some oil of cloves on cotton wool, thoroughly covering the dentin; this passes some distance into the tubuli, as the previous dehydration has prepared the tissue to receive the oil of cloves. Mop out any excess and again use the chip-syringe; when the excess is removed, fill the cavity.—D. E. CAUSH, *Brit. Dental Journal*.

Dental Profession Not Overcrowded.—The thought that dentistry is becoming too crowded is dominating the profession, and, in view of the number yearly being graduated from our colleges, the feeling is a natural one and must be accompanied, in the altruistic mind, with the fear that this overcrowding will lead to impoverishment of the many. The writer does not sympathize with this gloomy thought. In a sometime-since published article he endeavored to show that the increase in numbers was not in advance of the increase in population, and that all graduates of the present and for many years in the future would be needed.—*Editor Internat. Dental Journal*.

Hydronaphthol in Dental Therapeutics.—Hydronaphthol is too well known to need any description now. Its first and greatest claim is that it is a powerful antiseptic and yet is non-toxic and non-irritant, and—what to us as dentists is very important—the odor is not disagreeable. For convenience in using I keep hydronaphthol mixed with cement powder in the different proportions I generally use. I mix by weight, using one part hydronaphthol to five of powder, also one part to ten, one to twenty, one to fifty, and one to one-hundred. With these different proportions prepared and put in bottles, I can use them as readily as the plain cement powder. In a cavity so deep that I know I am unable to remove all infected dentin, I use the proportion one to one, or one to five, to be covered with one to one-hundred, or with clear cement or amalgam. If I want to put a non-conductor under gold I use one to twenty; under an inlay in a deep cavity I use one to twenty or thirty; for filling a pulp-chamber, one to twenty; for setting an inlay, one to one-hundred.—E. A. ROYCE, *Dental Review*.

Perforated Plate in Vulcanite Work.—Mr. C. F. Sutcliffe, L.D.S., at a meeting of the Odonto-Chirurgical Society, Scotland, stated that he had been making perforated plate and vulcanite dentures for some years and this work had afforded him and his patients much satisfaction. He claimed that the chief advantages are minimum and uniform thickness and maximum strength. Nothing can be more disappointing and unsatisfactory than the frequent fracture of vulcanite cases, which almost inevitably happens if the comfort of the patient is studied regarding the thickness of the vulcanite; this is particularly so in partial cases. (Here he showed models and described the *modus operandi* of executing the work, also a finished set of twenty-eight teeth made in perforated gold and vulcanite, which was much appreciated by the society.) The quickest way of obtaining the best results is—(1) Take a cast of plaster model in zinc, and counterpart in lead. (2) Strike up, the size required, a piece of thin soft metal. Now strike over this the perforated gold or alloy, No. 4 gauge, the size of the soft metal, excepting about three-sixteenths of an inch from the palate edge. It is now ready for striking over the full size a thicker soft-metal plate, and a thin soft-metal plate to use as a finishing plate when ready for vulcanizing, thereby saving time in filing up and polishing. The three plates are now struck and placed on the plaster model with the finishing plate from the base-plate on which the teeth are mounted. After trying on the mouth, proceed to flask in the ordinary way. When ready for packing, having removed the plates, pack over the palate a thin layer of vulcanite in lieu of the thin soft metal. Now place the finishing plate, thicker soft metal, and perforated plate on the counterpart of the flask, and squeeze into position the perforated plate. Open the flask carefully, remove the thicker soft metal, and pack in more vulcanite; close flask again to see that there is sufficient vulcanite in, and to avoid the finishing plate sticking to the vulcanite in this test, place a piece of clean damp rag over the vulcanite. Being satisfied that there is sufficient vulcanite on reopening the flask, remove the rag, close the flask, and vulcanize. There will be found after vulcanizing and removing from the flask a strong thin case with the lingual side polished and the rugæ distinctly marked. When nicely trimmed up, and finally polished, you will have a plate that will give you and your patient satisfaction.—*Dental Record*.

HINTS, QUERIES, AND COMMENTS.

THE BACTERIAL PLAQUES.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In the September number of the *Cosmos* Dr. Miller opens his very interesting paper with these words: "The following conclusions are to be drawn from the results of the experiments published in the January and February issues of the *DENTAL COSMOS*."

Dr. Miller then gives a series of numbered conclusions based on the papers mentioned, the eighth of which reads as follows: "Bacterial plaques are essential neither to the beginning nor to the progress of caries, nor does their presence necessarily result in the production of caries. It is possible that they may intensify processes of decomposition in particles of food clinging to the surfaces of teeth."

Turning to the series of papers referred to, I find in the opening paper published in the January issue of the *Cosmos* that Dr. Miller proposes fourteen questions as containing the factors of the problem which he is to investigate. No. 10 of these questions reads as follows: "Do the bacteritic membranes on the teeth afford a protection against, or do they facilitate, the process of caries, or are they indifferent to it?" Now, Dr. Miller's report of his investigations stops, in the February issue of the *Cosmos*, with a consideration of the seventh question. I have just re-read his papers carefully, and there is not one word in them bearing upon the nature and action of the bacterial plaques. On the face of the matter as it stands at present, therefore, he has given us a conclusion without a scrap of evidence upon which to base it.

The wording of the conclusion which I have quoted would, I believe, lead ninety-nine out of a hundred dentists to infer that, in Dr. Miller's opinion, bacterial plaques play no very important part in dental caries. Such an opinion seems to me to be opposed by an overwhelming mass of evidence to the contrary, and I therefore hope that Dr. Miller will lose no time in laying before us the evidence on which this statement is founded.

J. LEON WILLIAMS.

LONDON, ENG.

AN AMALGAM AUTOMATON.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—On page 683 of August 1903 *Cosmos* an amalgam automaton is mentioned. The idea is a very old one, as there have been several devices of this kind during the past twenty-five or thirty years.

None have proved practically useful or acceptable. The price of the contrivance is necessarily too high.

The size of the "make" is usually about the same, whereas every "make" of amalgam should be its own size, having relation to the cavity or cavities to be filled.

With the even, two-scale balance the mercury (two-thirds the size of the required mass of amalgam) is put into one scale, and the even weight of less, or more, of the alloy into the other, and the two proportions poured into the mortar or hand, and the thing is done.

J. FOSTER FLAGG.

SWARTHMORE, PA.

AN IDEAL AMALGAM MIXER.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I would present the following as, to my mind, an ideal amalgam mixer:

Take a rubber finger-tip, such as is used by surgeons, and after properly proportioning the alloy and mercury necessary for a filling, drop them together into the end of the finger-tip. Close the mouth of the finger-tip with the fingers of one hand, and with the others knead the mass together. Very quick and satisfactory results are obtained by this method, and soiling of the hands is also avoided. Excess of mercury may be removed in the usual way.

J. M. THOMPSON.

DETROIT, MICH.

STERILIZING INSTRUMENTS.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—The sterilizing of instruments is usually a bugbear to dentists. It is claimed that some expense attends it, and also that a busy

dentist cannot take the time. These reasons may be true, but the necessity for sanitary means remains the same.

As a student this principle was firmly implanted in my mind, and this simple and convenient method I have found very easy. May I suggest it to another busy man?

A ring bracket is fastened to the wall, by the side of the cabinet, in which place a heavy glass, to be three parts full of water with one teaspoonful of formaldehyd. This can be easily changed during the day, by pouring the contents into the spittoon, so that the pipes

can also be cleansed at the same cost. After using instruments, place them in this solution and let them remain. This is not repulsive to the patients and impresses them with the idea that they are the subjects of cleanliness. After the patient's departure, these instruments can be used as one uses an egg-beater and thus perfectly cleansed, wiped dry, and they are ready for the next patient.

Our experience has been that this care has always been highly appreciated.

H. A. JELLY.

ALLENTOWN, PA.

OBITUARY.

WILLIAM CARY BARRETT, M.D., D.D.S., M.D.S., LL.D.

DIED, at Bad Nauheim, Germany, August 22, 1903, of fatty degeneration of the heart with mitral insufficiency, Dr. WILLIAM CARY BARRETT.

Dr. Barrett was a son of Rev. Wm. and Hannah Cheney (Tanner) Barrett, and was born on May 13, 1834, in Monroe county, N. Y. He was therefore in his seventieth year.

After a thorough academic education, at Kingsville Academy, Ohio, and at Carey Seminary and Yates Academy, N. Y., he was for some years a teacher in different literary institutions in the state of New York. In 1863 he began the study of medicine, but in 1864 he changed to that of dentistry, receiving the degree of master of dental surgery in 1869 from the Dental Society of the State of New York. He began dental practice in the village of Warsaw, Wyoming county, N. Y., and remained there until the spring of 1876, when he moved to Buffalo, and in 1877 again took up the study of medicine in the medical department of the University of Buffalo, graduating with the degree of M.D. in 1880. He also attended lectures in the Pennsylvania College of Dental Surgery, in Philadelphia, and was graduated from that institution with the degree of doctor of dental surgery in 1880.

After that time he was engaged in the practice of his profession in the city of Buffalo.

In 1885 he received the appointment of lecturer of oral pathology in the medical department of the University of Buffalo, his alma mater, and in 1890 was elected to the full professorship. In 1889 he was elected professor of morbid anatomy and pathology in the Chicago College of Dental Surgery, the dental department of Lake Forest University, but still continued to maintain his residence in Buffalo. After that appointment he visited Chicago regularly for the purpose of delivering his lectures and giving the instruction belonging to his chair.

Upon the organization of the dental department of the University of Buffalo, in 1891, Dr. Barrett was appointed professor of the principles and practice of dentistry and dental pathology, and was elected dean of the faculty, which position he held at the time of his death. He was also one of the staff of the Buffalo General Hospital, holding the position of oral surgeon in that institution.

From 1882 until 1888 he was editor of the *Independent Practitioner*, devoted to dental medicine and surgery. In 1888 it was sold, and the editor retired from journalism, but in 1891 he again entered the field as editor of the *Dental Practitioner*, of Buffalo. Dr. Barrett made notable collections in comparative dental anatomy, and was the author of many monographs bearing upon the subject of dental medicine.

As a writer in his chosen field Dr. Barrett

had few equals. His early academic training and a natural facility of expression combined to fit him for his work as author and editor, and gave to his literary work a special charm quite apart from its technical value. His style was vigorous and fluent, and always set forth in forcible terms the convictions of his active mind. He possessed a keen sense of humor, which at times enlivened the productions of his pen and often shone forth in debate or in postprandial orations, where it was exhibited to best advantage. It is interesting to note in this connection that on the Fourth of July last, and but a few weeks before his death, he made the principal speech at a celebration of the anniversary of our national independence held by American citizens in Bad Nauheim, and his oration on that occasion created much enthusiasm.

Dr. Barrett's interest as teacher and author lay more particularly in the domain of human and comparative anatomy and in pathology, in which lines he has made some notable contributions to our literature. As an educator and promoter of all that makes for higher professional standards he was always keenly active. The head of an important dental educational institution, and fulfilling the duties of a professorial chair in another, he still found time and energy for his activities in promoting professional welfare in other directions. Several years ago he became interested in adjusting international relationships in the matter of dental education, and, as chairman of the Committee on Foreign Relations of the National Association of Dental Faculties, he undertook and carried on a work which perhaps more than any other brought him into international prominence. As a contributory factor to the ends which he had in view in the betterment of American dental standards in the eyes of the world, he engaged energetically in the prosecution of certain bogus institutions which were illegally conferring the dental degree *sine curriculo*, and for his success in bringing the principals in this traffic to justice the degree of LL.D. was honorarily conferred upon him by Lake Forest University of Chicago.

Earnest and enthusiastic in every endeavor, fearless in defense of his views, a loyal friend, an earnest teacher, a lover of his profession, and a willing champion of all who sought his help or guidance—these are some of the qualities of his many-sided character that made him a leader in his profession.

Dr. Barrett was married in 1857 to Miss Amelia Harris Ryerse, of Port Ryerse, Ontario, Canada. They have no children.

His remains will be brought home for interment, but as we go to press no details of the funeral arrangements have been received.

DR. R. HOWARD EDMONSTON.

DIED, September 8, 1903, at Brooklyn, N. Y., of diphtheria, R. HOWARD EDMONSTON, D.D.S.

Dr. Edmonston was born in Palmyra, N. Y., in 1879, being at the time of his death in his twenty-fifth year. In the fall of 1898 he commenced the study of dentistry at the University of Buffalo, and was graduated with the class of 1901. His first practice was in Deposit, N. Y., but after about four months he formed a partnership with a Brooklyn dentist.

This partnership was finally dissolved, and at the time of his death he was conducting an individual practice in Manhattan avenue, Brooklyn, N. Y., where he was establishing an enviable reputation among the younger dentists of that vicinity.

The illness which caused the death of Dr. Edmonston was of but three days' duration, and the news of his sudden death came an unwelcome message to his many friends throughout New York state, especially to those in his boyhood's home and to the younger members of the dental profession, whose loyalty to him was the best evidence of his high personal and professional character. Dr. Edmonston was a member of Mu chapter, Xi-Psi-Phi Fraternity, which by his death keenly realizes the loss of a loyal brother, and the heartfelt sympathy of which is with the bereaved parents who survive him.

SOCIETY NOTES AND ANNOUNCEMENTS.

UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

FOURTH INTERNATIONAL DENTAL CONGRESS.

August 29 to Sept. 3, 1904.

Committee of Organization Dental Congress.

H. J. BURKHART, Chairman.
E. C. KIRK, Secretary.

R. H. HOFHEINZ,	J. W. DAVID,
WM. CARR,	WM. CRENSHAW,
W. E. BOARDMAN,	DON M. GALLIE,
V. E. TURNER,	G. V. I. BROWN,
J. Y. CRAWFORD,	A. H. PECK,
M. F. FINLEY,	J. D. PATTERSON,
B. L. THORPE.	

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

- I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer.
- II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.
- III. Chemistry and Metallurgy. Chairman, J. D. Hodgen.
- IV. Hygiene, Prophylaxis, Therapeutics, Materia Medica, and Electro-therapeutics. Chairman, A. H. Peck.

DEPARTMENT B—APPLIED SCIENCE.

- V. Oral Surgery. Chairman, G. V. I. Brown.
- VI. Orthodontia. Chairman, E. H. Angle.

VII. Operative Dentistry. Chairman, C. N. Johnson.

VIII. Prosthesis. Chairman, C. R. Turner.

IX. Education, Nomenclature, Literature, and History. Chairman, Truman W. Brophy.

X. Legislation. Chairman, Wm. Carr.

COMMITTEES.

The following committees were appointed:

- Finance. Chairman, C. S. Butler.
- Program. Chairman, A. H. Peck.
- Exhibits. Chairman, D. M. Gallie.
- Transportation. (To be appointed.)
- Reception. Chairman, B. Holly Smith.
- Registration. Chairman, B. L. Thorpe.
- Printing and Publication. Chairman, W. E. Boardman.
- Conference with State and Local Dental Societies. Chairman, J. A. Libbey.
- Dental Legislation. Chairman, Wm. Carr.
- Auditing. (Committee of Organization.)
- Invitation. Chairman, L. G. Noel.
- Membership. Chairman, J. D. Patterson.
- Educational Methods. Chairman, T. W. Brophy.
- Oral Surgery. Chairman, G. V. I. Brown.
- Prosthetic Dentistry. Chairman, C. R. Turner.
- Local Committee of Arrangements. (To be appointed.)
- Essays. Chairman, Wilbur F. Litch.
- History of Dentistry. Chairman, Wm. H. Trueman.
- Nomenclature. Chairman, S. W. Foster.
- Promotion of Appointment of Dental Surgeons in the Armies and Navies of the World. Chairman, Wms. Donnally.
- Care of the Teeth of the Poor. Chairman, Thomas Fillebrown.
- Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.
- Prize Essays. Chairman, James Truman.
- Oral Hygiene, Prophylaxis, Materia Medica, Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck.
- Operative Dentistry. Chairman, C. N. Johnson.

Resolutions. Chairman, J. Y. Crawford.
 Clinics. Chairman, C. E. Bentley.
 Nominations. (To be appointed.)
 Local Reception Committee. Chairman,
 Wm. Conrad.
Ad interim. Chairman, G. V. I. Brown.

The officers of the Congress, president, vice-presidents, secretary, and treasurer, will be elected by the Congress at large at the time of the meeting, and will be nominated by the Nominating Committee.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,
 E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.
 DAVID R. FRANCIS, *President of Exposition*.

PROVINCIAL DENTAL BOARD OF NOVA SCOTIA.

At the annual meeting of the Nova Scotia Dental Board, held at Annapolis, N. S., September 2, 1903, the following officers were elected: Hibbert Woodbury, Halifax, president; Geo. K. Thomson, Halifax, secretary-registrar; A. W. Cogswell, Halifax, treasurer. Prof. Howard Murray, matriculation examiner. Final examiners—Members of the Dental Board.

GEO. K. THOMSON, *Sec'y*, Halifax, N. S.

NOVA SCOTIA DENTAL ASSOCIATION.

THE thirteenth annual convention of the Dental Association of the Province of Nova Scotia was held at Annapolis, N. S., September 2 and 3, 1903.

Officers elected for the ensuing year: F. W. Stevens, president; James Primrose, vice-president; L. St. Clair Saunders, second vice-president; F. W. Ryan, secretary. The executive committee consists of the foregoing officers with Dr. H. Lawrence. Auditors, Drs. Fluck and Beckwith.

The association having been asked to appoint a Provincial secretary to act upon the executive committee of the Canada Dental Association, Dr. H. Lawrence was appointed to the position. F. W. RYAN, *Sec'y*.

TENNESSEE DENTAL ASSO- CIATION.

THE thirty-sixth annual meeting of the Tennessee Dental Association was held at Lookout Inn, Chattanooga, Tenn., July 23, 24, and 25, 1903, Dr. W. K. Slater presiding. The meeting was a good one, pronounced by many to be the most interesting one held for several years. Ten excellent papers were read and thoroughly discussed. The president's address was an especially happy effort, his theme being "Dental Ethics." Dr. A. A. McLanahan, of Springfield, had charge of the clinics, and of course that part was a success. The "inlay man" was very much in evidence.

Quite a number of the profession from other states were present and added to the interest of the occasion. Several, however, who would otherwise been present were kept away on account of the Faculties meeting at Asheville occurring at the same time.

The following officers were elected for the ensuing year: R. Boyd Bogle, Nashville, president; J. D. Towner, Memphis, first vice-president; A. J. Cottrell, Knoxville, second vice-president; J. T. Crews, Jackson, recording secretary; W. K. Slater, Knoxville, corresponding secretary; W. P. Sims, Nashville, treasurer. Member of executive committee: P. M. Joyner, Union City. Essay committee: W. C. Gillespie, Nashville; A. J. Cottrell, Knoxville; J. D. Towner, Memphis. Chairman clinic committee, A. A. McLanahan, Springfield.

The next meeting will be held at Jackson, Tenn., on a date to be selected by the executive committee.

A. SIDNEY PAGE, *Sec'y*.

SEVENTH AND EIGHTH DISTRICT SOCIETIES (N. Y.).

THIRTY-FIFTH ANNUAL UNION MEETING.

THE thirty-fifth annual union meeting of the Seventh and Eighth District Dental Societies of the State of New York will be held at the Osburn House, Rochester, N. Y., October 27, 28, and 29, 1903. An excellent meeting, with numerous clinics, is promised. One day will be devoted exclusively to clinics, with discussions of same in the evening. Application has been made for reduced railroad rates. Exhibitors desiring space are requested to communicate with the hotel or the Business Committee.

An incomplete program follows:

Papers.—I. L. M. Waugh, Buffalo, N. Y.: "Histology of Dentin, Illustrated with Lantern Slides." C. W. Stainton, Buffalo, N. Y.: Subject to be announced. Harry L. Belcher, Buffalo, N. Y.: Subject to be announced. J. W. Beach, Buffalo, N. Y.: "New Remedies." Robert Brewster, Chicago, Ill.; "The Avoidance of Opacity in Porcelain Inlays, and the Use of Oil Colors in Porcelain Work." A. Osgood, Bath, N. Y.; "The Vacuum Chamber." L. S. Goble, Rochester, N. Y.: "Practical Sterilization for the Dentist."

Clinics.—[The list of clinics already arranged for, amounting to about forty interesting demonstrations, is omitted on account of pressure on COSMOS space.]

A complete program will be issued on October 13th.

W. W. SMITH, *Ch'man Bus. Com.*,
63 East ave., Rochester, N. Y.

AMERICAN SOCIETY OF ORTHODONTISTS.

THE third annual meeting of the American Society of Orthodontists will be held on December 30 and 31, 1903, and January 1, 1904, in Buffalo, N. Y.

ANNA HOPKINS, *Sec'y*, St. Louis, Mo.

SOUTHWESTERN IOWA DENTAL SOCIETY.

THE seventh annual meeting of the Southwestern Iowa Dental Society will be held on October 13 and 14, 1903, at Albia, Iowa.

J. A. WEST, *Sec'y*, Creston, Iowa.

NORTHEASTERN DENTAL ASSOCIATION.

THE ninth annual meeting of the Northeastern Dental Association will be held in the New Horticultural Hall, corner Massachusetts and Huntington avenues, Boston, Mass., October 21, 22, and 23, 1903. An interesting meeting and a full line of exhibitors is promised.

Boston is an ideal place for a large meeting. Come and help make it so!

EDGAR O. KINSMAN, *Sec'y*,
Cambridge, Mass.

SIXTH DISTRICT (N. Y.) DENTAL SOCIETY.

THE thirty-fifth semi-annual meeting of the Sixth District Dental Society of the state of New York will be held at the Eagle Hotel, Norwich, Chenango county, on October 8 and 9, 1903. The meeting will be called to order at 4.30 P.M. Thursday, October 8th.

Program.—Vice-President's Address, by Albert V. Needham, Oneida. Essays: "The Artistic in Plate Work," M. H. Fish, New Berlin; (subject to be announced), H. H. Turner, Marathon; "Contouring a Necessity in Filling and Crown Work," W. J. Ingram, Binghamton. Clinics: "Taking Plaster and Modeling Composition Impressions," M. B. Ingalls, Cortland; "The Treatment of Congested Pulp," A. M. Holmes, Morrisville; "Contour Gold Fillings," C. M. Dunne, Norwich; "Porcelain Inlays—The Jenkins System," H. D. Whitmarsh, Binghamton.

FREDERIC W. MCCALL, *Sec'y*, Binghamton.

INSTITUTE OF DENTAL PEDAGOGICS.

THE next annual meeting of the Institute of Dental Pedagogics will be held at Buffalo, N. Y., December 28, 29, and 30, 1903. A complete program is being arranged, which will be exceedingly interesting. It will be published in full in the next issue of this journal. W. H. WHITSLAR, *Chairman*.

MASSACHUSETTS BOARD OF REGISTRATION.

THE next meeting of the Massachusetts Board of Registration in Dentistry for the examination of applicants will be held October 28, 29, and 30, 1903.

Application blanks and all necessary information furnished by the secretary.

GEO. E. MITCHELL, *Sec'y*,
25 Merrimack st., Haverhill, Mass.

MARYLAND BOARD OF DEN- TAL EXAMINERS.

THE Maryland State Board of Dental Examiners will meet for examination of candidates on November 4 and 5, 1903, at the Baltimore College of Dental Surgery, Baltimore, at 9 A.M.

For application blanks and full particulars apply to

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

DENTAL COMMISSIONERS OF CONNECTICUT.

THE Dental Commissioners of the state of Connecticut will meet at Hartford, on Wednesday, Thursday, and Friday, November 18, 19, 20, 1903, respectively, to examine applicants for license to practice dentistry, and for the transaction of any other proper business.

The practical examination in operative and prosthetic dentistry will be held Wednesday, November 18th, at 9 A.M., in Putnam Phalanx Armory, corner Haynes and Pearl streets. The written theoretic examination will be held Thursday and Friday, November 19th and 20th, at the Capitol.

All applicants should apply to the Recorder for proper blanks, and for the revised rules for conducting the examinations. Application blanks must be carefully filled in

and sworn to, and with fee, twenty-five dollars, filed with the Recorder on or before November 10, 1903.

By direction of the Dental Commissioners.

J. TENNEY BARKER, *Recorder*,
Wallingford.

MINNESOTA BOARD OF DENTAL EXAMINERS.

THE next meeting of the Minnesota State Board of Dental Examiners will be held October 6th, at the Dental Department of the State University at Minneapolis, Minn.

Candidates should bring their diplomas, also instruments for insertion of a gold filling.

F. E. MOODY, *Pres't*, Minneapolis, Minn.

C. H. ROBINSON, *Sec'y*, Wabasha, Minn.

OHIO BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of the State of Ohio will meet in Columbus, Ohio, November 24, 25, and 26, 1903, at Hotel Hartman, for the examination of candidates for certificates of registration.

Application should be filed with the Secretary by November 14th. For further particulars address

H. C. BROWN, *Sec'y*, 185 E. State st.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS.

THE next regular semi-annual meeting of the South Dakota State Board of Dental Examiners to examine applicants for license to practice in the state will be held in Vermillion, December 8, 9, 10, and 11, 1903, beginning at 8 o'clock P.M. Positively no candidates will be received for examination after the 8th. Only those who hold diplomas from reputable dental colleges, and those having had three years of actual practice in dentistry immediately preceding the examination are eligible to take the same.

Candidates must come prepared to do all kinds of fillings. They must also bring with them teeth and the necessary utensils for doing both bridge and vulcanite work.

The examination fee is ten dollars, and subsequently five dollars will be required if applicant is successful in passing the examination.

G. W. COLLINS, Vermillion, S. D.

ILLINOIS BOARD OF DENTAL EXAMINERS.

THE next regular meeting of the Illinois State Board of Dental Examiners to examine applicants for license to practice dentistry in this state will be held in Chicago, October 15, 16, and 17, 1903.

The following are eligible to take the examination before the Board: "Anyone holding a medical diploma from a reputable college; anyone who has been a legal practitioner of dentistry for ten years prior to moving into the state, and anyone who failed to register in this state at the time the law went into effect, which was in 1881."

Candidates must furnish their own patients, and come provided with the necessary instruments, rubber dam, and gold to perform practical operations and such other work as is deemed advisable by the board. Those desiring to take the examination should matriculate with the secretary at least ten days before the date of meeting. The examination fee is ten dollars. Any further information can be obtained by addressing

J. G. REID, D.D.S., *Sec'y*,
1204 Trude Bldg., Chicago.

NEW JERSEY BOARD OF REGISTRATION.

THE State Board of Registration and Examination in Dentistry of New Jersey will hold their semi-annual examination in the assembly room of the State-house at Trenton, N. J., on the 20th, 21st, and 23d of October 1903. All applicants are required to file their applications with the secretary ten days prior to the examination. Sessions begin promptly at 9 A.M. each day. For information in regard to examination communicate with the secretary, 29 Fulton street, Newark, N. J. Fee for examination twenty-five dollars.

CHAS. A. MEEKER,
Sec'y Dental Commission.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

It is earnestly requested that all the secretaries of the Boards of Examiners throughout the states and territories mail to the secretary all changes in their respective boards, and greatly oblige

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING AUGUST 1903.

August 4.

No. 735,543, to MALIZAN & PROCHASKA. Dentist's clamp.

August 11.

No. 735,762, to WM. HARE. Dental mouth-prop, mirror, and tongue protector.

No. 735,929, to JAMES I. WOOLVERTON. Dental mixing tablet.

No. 736,059, to GEORGE L. BENNETT. Device for administering anesthetics.

No. 736,101, to GERSHOM B. HOUGH. Dental tool.

No. 736,114, to LEONARD G. KOENIG. Grinding or polishing cone.

No. 736,174, to JOHN TURCK. Clamp.

No. 736,336, to WALTER H. ROBERTS. Process of vulcanizing.

August 18.

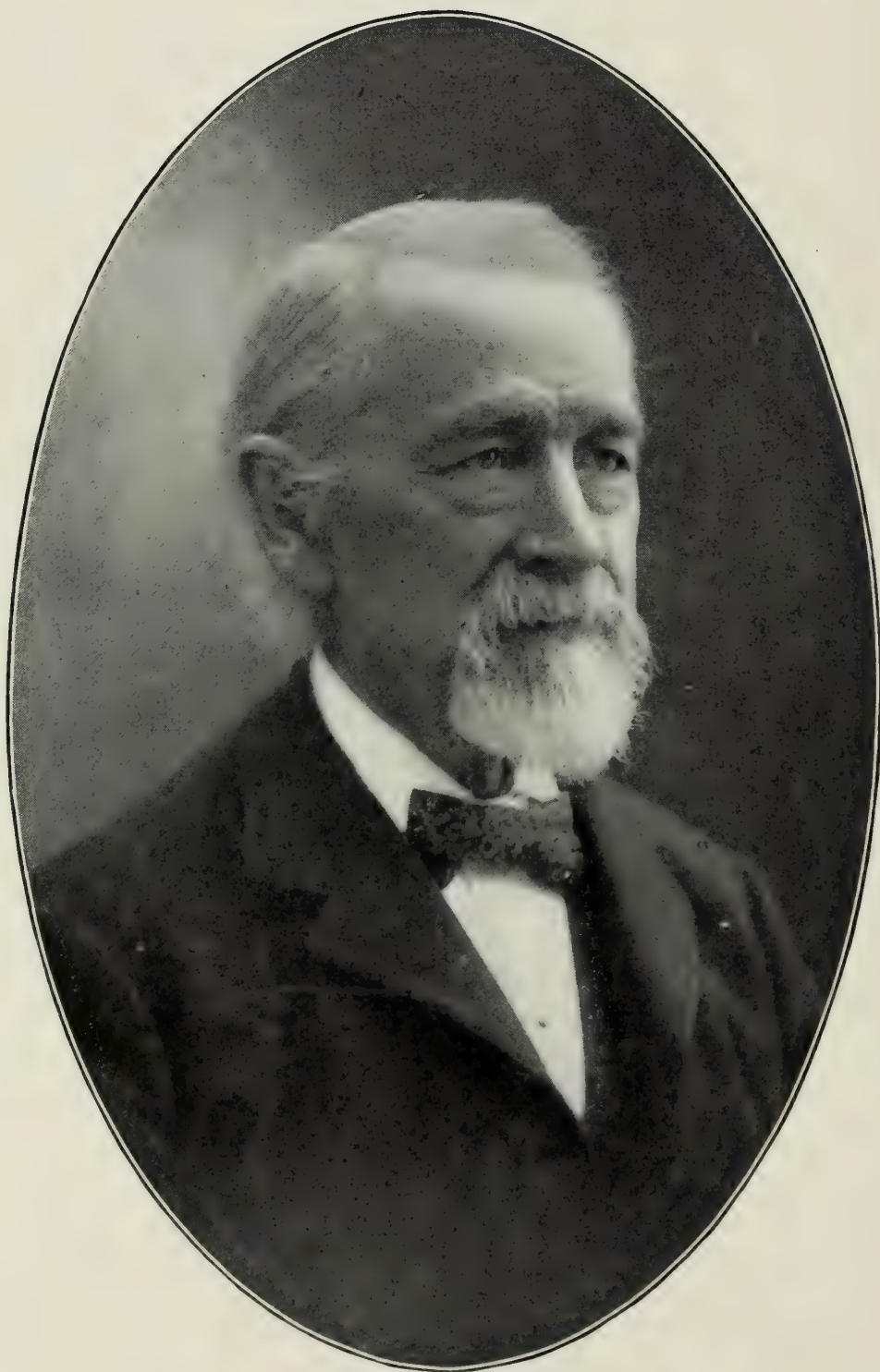
No. 736,378, to CHARLES R. LANE. Tooth-brush appliance.

No. 736,650, to JORDAN E. STORMS, Jr. Tooth-cleaning appliance.

No. 736,844, to WM. N. GREER. Head-rest.

August 25.

No. 737,287, to CHAS. P. SCHULTZ. Dental mixing mortar.



J. H. Yaffa. M.D. W.D.S.

THE DENTAL COSMOS.

VOL. XLV.

NOVEMBER, 1903.

No. 11.

ORIGINAL COMMUNICATIONS.

THE PRACTICAL TEACHING OF ANATOMY IN DENTAL SCHOOLS.

By MATTHEW H. CRYER, M.D., D.D.S., Philadelphia, Pa.,

PROFESSOR OF ORAL SURGERY, UNIVERSITY OF PENNSYLVANIA.

(Read before the Section on Odontology and Stomatology, Fourteenth International Congress of Medicine, Madrid, April 23, 1903.)

DENTISTRY is now quite commonly regarded as a separate profession of the healing art, and its practice is becoming more highly specialized each year. As it is inclined to adopt its own teachers and conduct its educational work separately from general medicine and surgery, the question arises, What should the student know, to enable him to carry on his profession in a practical, skilful, and scientific manner?

It has been generally accepted that, among other fundamental subjects, the dental student should know anatomy; but just how much of the general anatomy of the human body shall be taught to the prospective dentist is a question which must be considered in the light of his needs as a practitioner.

In my opinion, the student should first have a good general understanding of the structures of the body as a whole, and upon this as a basis should build up his knowledge of the practical and surgical anatomy of the oral region and its associated parts. The acquisition of

such a knowledge of general anatomy is indispensable in order that the student may correctly understand the processes of nutrition, reflex action, etc., which sustain and control those special parts of the organism to which he intends to devote his time and trained intelligence. The special anatomy should be taught with one chief object always in view, *i.e.* to determine how this particular region can best be treated, therapeutically and surgically.

The field of the stomatologist being in and about the mouth, it is essential that that cavity, with all its anatomical relations, physiological functions, and influences, should be thoroughly known. The mouth and its fluids are an index to many of the diseases of the body, therefore this portal of the organism, and its continuation, the alimentary canal, through which the whole system receives nourishment, should be most closely studied. The beginning of the respiratory tract is directly associated with the oral cavity, and may be, and often is,

functionally substituted for the nasal cavity. Therefore the dental student should have a complete knowledge of the respiratory tract, including the lungs. The general circulatory system should be well understood, with special knowledge of the heart and of the vessels going to and returning from the face and head. The general anatomy of the brain and spinal cord should be studied, with special attention to the cranial nerves, and careful study should be made of the relations of the mouth with the neck, the nasal fossæ with the associated pneumatic sinuses, cells, etc.; also the anatomy and functions, whether normal or perverted, of the various glands of the mouth and neck, including those associated with the pharynx.

Accepting the fact that anatomy is to be taught to students of stomatology, the question naturally arises, What are the best methods for such work? The preliminary teaching of general anatomy can be done by those who thoroughly understand that branch, whether they have the degree of M.D., D.D.S., or no degree at all. After the student has acquired the preliminary knowledge he is ready for the special teaching in relation to the oral cavity and its associated parts. This applied anatomy should be taught by those who are specialists in that work, who alone are competent to instill into the student's mind the importance of anatomy in relation to his work as a stomatologist.

The next point which presents itself is, How shall this special anatomy be taught? Let it be borne in mind, as a general proposition, that there is something more in teaching than merely standing before a class and lecturing upon a given subject. It must be presented in such a manner that the student shall grasp it—shall make his own the information which the teacher imparts. Instruction embraces reception by the student as well as presentation by the teacher; this dual quality is the object and essence of teaching in the correct sense of the term. Any method which does not have that result—the instilling and installing in the mind of the student

a clear, definite knowledge of the subject—is a failure.

Shall we attain this desirable end by lectures and stereotyped methods so common in the classroom, or by actual contact with the subject as it is gained only in the dissecting room?—by removing the skin, the superficial fascia, the deep fascia, and then working out, to its origin, each muscle and nerve, artery and vein, etc.? The text-book and dissecting method are not without value to the training of the purely descriptive anatomist, but in my opinion they do *not* meet to the full degree the requirements of the surgeon. When the surgeon operates he must know what lies immediately under his knife, bur, or saw, and be able to recognize structures as he comes in contact with them without having to mentally trace them to their origin. At the time of operation he cannot ascertain with what structure he is dealing by tracing, as the dissector of the cadaver does, the origin and insertion of muscles. He must know the regional anatomy which is comprised in the area of operation.

The methods adopted by the general descriptive anatomists in the dissecting rooms are laborious and impose upon the learner a great amount of technicality. It is doubtful to my mind whether it is justifiable to compel dental surgeons to make these minute dissections of the whole body, or even of the greater portion of the body. The method is often carried to such an extent that the student seems to study dissection instead of anatomy, and I have known good prosectors who have been doing work for years, but who, when questioned on practical applied anatomy, knew but little about it. Even when a student has made a good dissection of a leg or arm he must get a demonstrator to tell him what he has uncovered. Would it not save valuable time to the dental student to have the greater portion of the bodies dissected by trained dissectors and have the demonstrator explain the parts to the student until he knows them so well that he could in turn explain each part to the demonstrator? It is often claimed that

the dissection will give the student technical ability. This is true to some extent where medical students are concerned who have otherwise but little technical work, but the dental student does not specially need it, as his technical ability is developed in other and more useful ways.

No other branch of study in the dental, or even the medical curriculum, is so soon forgotten as anatomy. I believe that the fault lies, not in the fact that it is anatomy, but that it is not taught by the right method; for we ought most certainly to obtain better results, considering the time that is taken up for the conveyance of anatomical instruction through lectures and in the dissecting room. In the first place, it must be demonstrated to the student that the use of this knowledge will enable him to more intelligently practice his profession; the matter should be brought before him from the standpoint of its utility in practice, as well as in as interesting a manner as it is possible to present it.

During the past ten years I have tried various methods of teaching the internal anatomy of the face, and I think I have been most successful through the use of the method of making sections of the head in various directions, then photographing and making slides from the same for use with the projecting lantern. It is found that students become more interested in the lectures when pictures of the specimens are thrown upon the screen than when the specimen is held in the hand or when the head is placed upon the table. They cannot all see the specimen, but all can see the pictures, so that the knowledge is conveyed to the brain by two avenues, sight and hearing, and to all simultaneously.

Many of the sections of the head which have been used in this teaching were cut when the specimen was partly dried. Such a section answers a good purpose, especially in and about the nose and its associated pneumatic sinuses and cells, but these dried specimens have one serious fault—the soft tissues have shrunk,

and are far from showing what they were in life. Therefore other means should be used.

The best of the modern applied anatomists are now adopting the following plan: The bodies secured for this work should be those that have not lost their true anatomical form through disease. They should be prepared as soon as possible after death, first by injecting with a solution of formalin to harden the soft tissues, after which a magma of plaster of Paris is injected; then the body is covered with a coating of vaselin and wrapped in cloths, after which it is placed in a refrigerator at a temperature of about 15° F. When thoroughly frozen it is ready for sectionizing. The saw for making the sections should have a thin, broad blade, with fine chisel-shaped teeth. In this way and by this means the finest bone can be cut without fracture, and even the soft tissue of the brain without displacement.

The illustrations accompanying this paper show examples of sections prepared after both methods—from dried and from frozen specimens. They, with many others, have been used with the projecting lantern to illustrate lectures delivered to the students of one of the dental schools of the United States. Other dental colleges have many of these slides duplicated for teaching purposes. Teachers in the medical schools are also using them, and half-tone illustrations are being made from them for textbooks.

In order to show the contrast between such sections and an ordinary illustration, a copy of the frontispiece of a leading American text-book on "Diseases of the Nose and Throat" is first shown. (Fig. 1.) It gives a good picture of a sagittal section, showing an idealized anatomy of the nose, mouth, and throat. It might be classed as typical anatomy, but those who are familiar with the internal anatomy of the parts will recognize at once that the general anatomical shape of the open space is at variance with their observation. Surgical operations would be much simplified if the parts were always as represented here!

Commencing with the turbinates, it will be seen that their lower borders are too straight and their surfaces too even. The general view of the posterior ends of the turbinate bones from the pharynx are too clearly seen. The Eustachian orifice is also too plainly exposed to view. The space between the soft palate and the post-pharyngeal wall is too vast, even with the mouth open wide; the tongue is too flat; and again, there is too much space near the opening of the pharynx.

The next illustration (Fig. 2) is made from a photograph of a sagittal section cut from a frozen cadaver after the plan already described. A marked difference will be noticed on comparing the two illustrations, but it must be remembered that in the first the mouth was represented as being wide open, while in the second it is closed, which will make some difference in the relations of the tongue with the roof of the mouth and the post-pharyngeal wall. In Fig. 2 it will be noticed that a sagittal section of the various structures of the brain is well shown. The turbinate bones of the nose are also well exposed. In describing the floor of the nose as here represented we should say that it extends from the anterior nares backward and slightly downward in a somewhat convex line to near the post-pharyngeal wall, without a line of demarkation. This is contrary to the general teaching, but it is actual anatomy in the great majority of cases. The posterior part of the space, the "nasopharynx," is often spoken of as the upper end of the alimentary canal. This is a mistake, as the naso-pharynx has nothing to do with alimentation. Its epithelium is of the ciliated columnar type, the variety presented in the respiratory tract.

The general shape of the mouth at the median line is well shown. The hard and soft palates, I think, should be described as extending from the anterior teeth backward and slightly down in a concave line to near the post-pharyngeal wall, leaving scarcely any space, as here shown.

In the normal living subject, when the mouth is closed, the soft palate, the posterior border of the tongue, and the epi-

glottis are all in close proximity to the post-pharyngeal wall. The soft palate, on its nasal surface, is higher along the center line than at the edges, a shape which causes the fluids from the nose and its accessory sinuses and cells to be directed toward the outer wall of the pharynx, and on to the esophagus. The base of the tongue also acts in a similar manner to the oral cavity. The epiglottis is so shaped as to throw the fluids to the side of the pharynx past the opening of the larynx. It does not, as described by some, shut down like a trap-door over the glottis to prevent fluids from passing into it.

The illustration Fig. 3 is made from a horizontal section cut on a level at the junction of the upper lip and nose, showing a longitudinal section of the septum of the nose and the lower borders of inferior turbinate bones and the maxillary sinus. Within the outer wall of the nasal chamber, in the region of what is often called the naso-pharynx, will be noticed the longitudinal section of the Eustachian tube. A little posterior to which are the sinuses of Rosenmüller, through which respiration can be carried on regardless of the position of the soft palate or tongue.

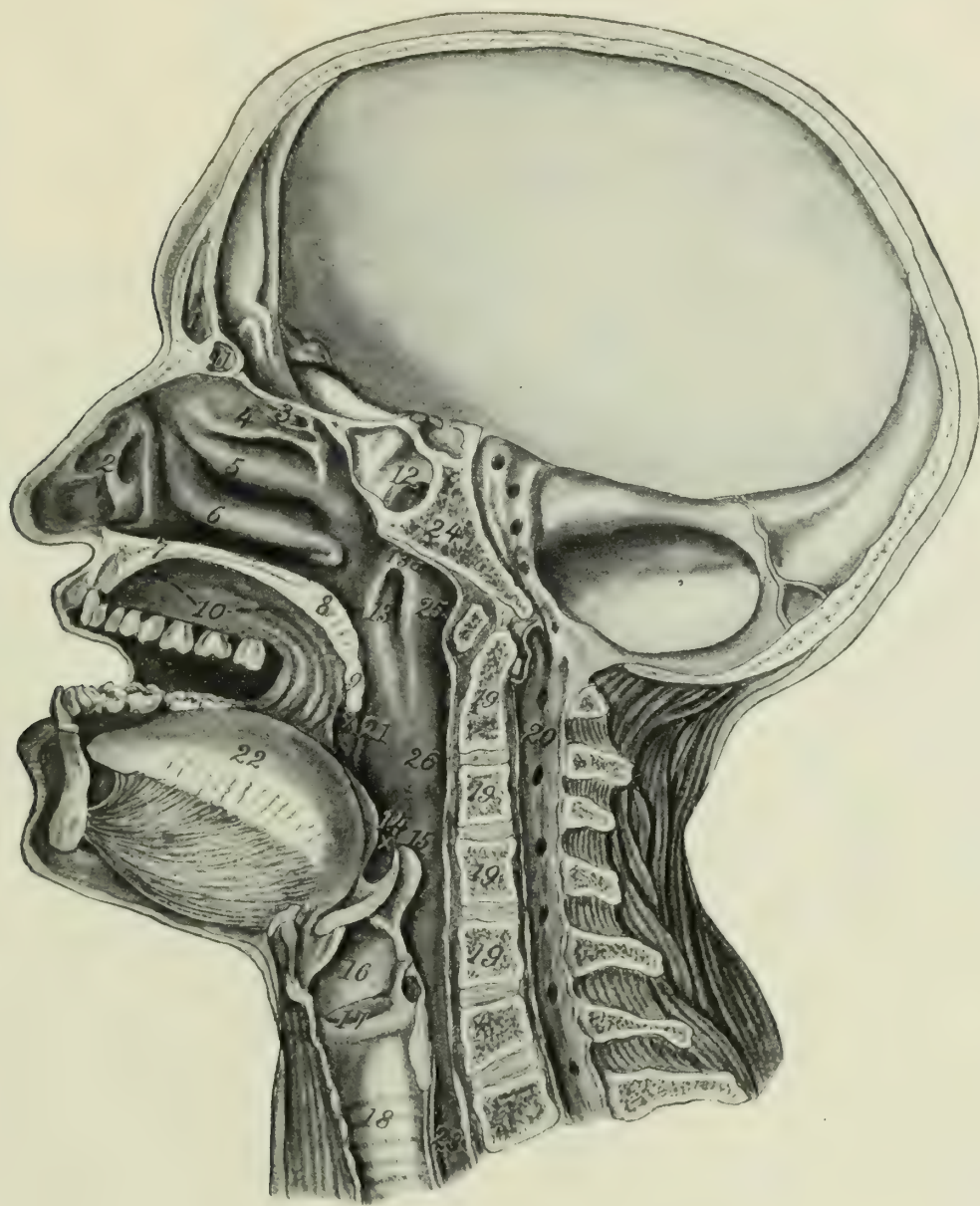
In the previous illustration (Fig. 2) a sagittal section of the tongue is well shown, occupying the space from the anterior teeth backward nearly to the post-pharyngeal wall, and from the floor of the mouth nearly to the roof. It almost completely fills the space, which is quite different in form from that shown in the first illustration and from the general idea given in the text-books. I understand that Professor Donder has spoken of the space between the roof of the mouth and the tongue as acting somewhat on the same principle as the vacuum chamber in the upper artificial denture, *i.e.* when the air is exhausted by the action of the tongue a partial vacuum is created when the tongue is slightly relaxed, by the action of which the weight of the lower jaw, with the tongue, is overcome to a certain extent.

The genio-hyoid and the genio-hyoglossus muscles are well shown, radiating

from their point of origin. The structures composing the floor of the mouth are shown. The epiglottis is seen at the base of the tongue passing upward and backward until its upper border comes in contact with the post-pharyngeal wall. The upper or oral surface of the epi-

dried skull looking forward. It is cut vertically through the center of the orbit, the nasal chambers, the maxillary sinuses, and the first molar teeth of both jaws. This section affords a good idea of the general shape of the various cavities and of their relations with each

FIG. 1.

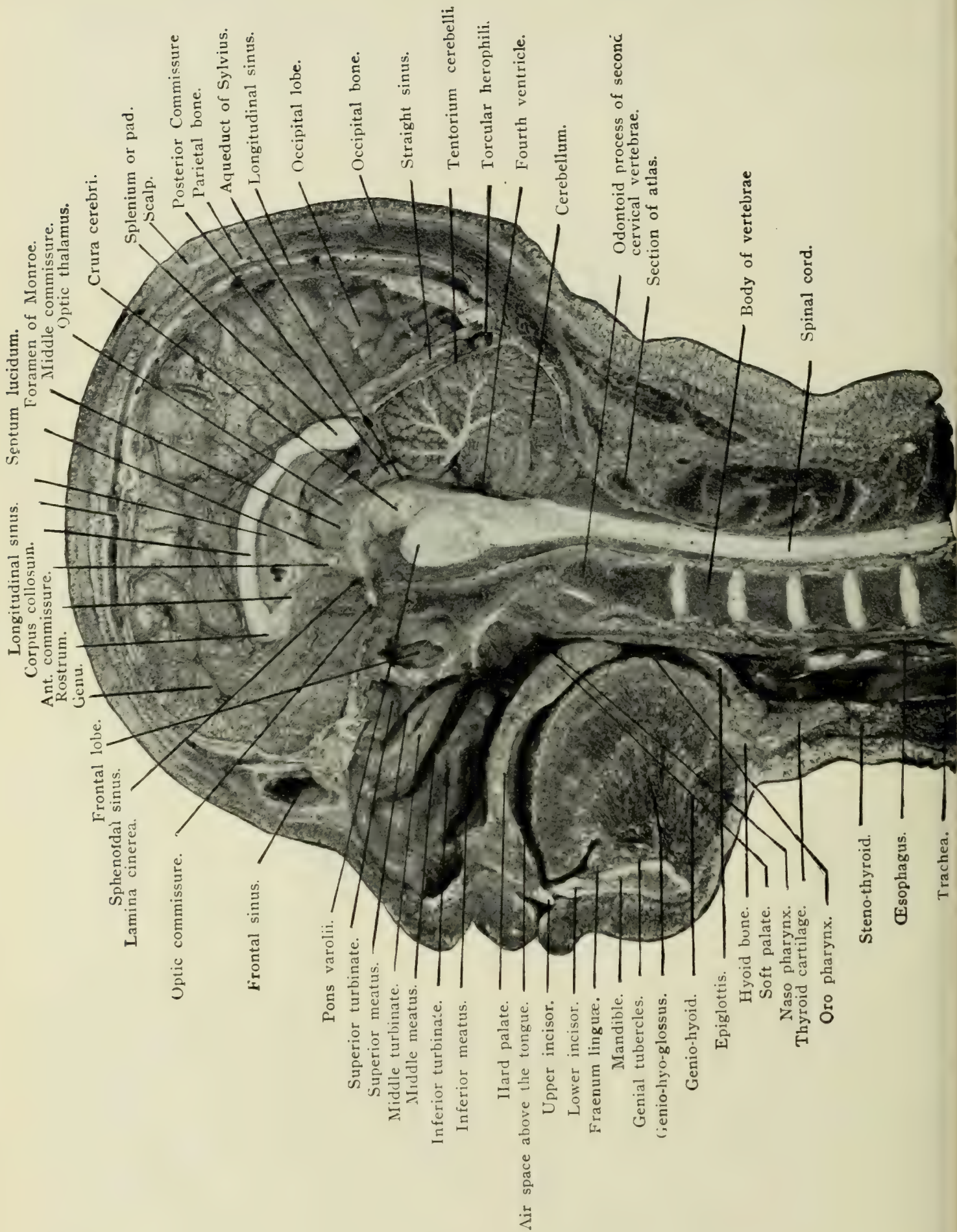


glottis is divided into two parts. The lower portion or base, which carried the fluids outward, is convex, while the upper portion is concave. The under or laryngeal surface of the epiglottis is also divided into two parts. The lower portion or base is concave, while the upper portion is convex, and is formed by coming in contact with the post-pharyngeal wall. Below the epiglottis is the larynx.

The illustration Fig. 4 is a view of a transverse bilateral section of a partly

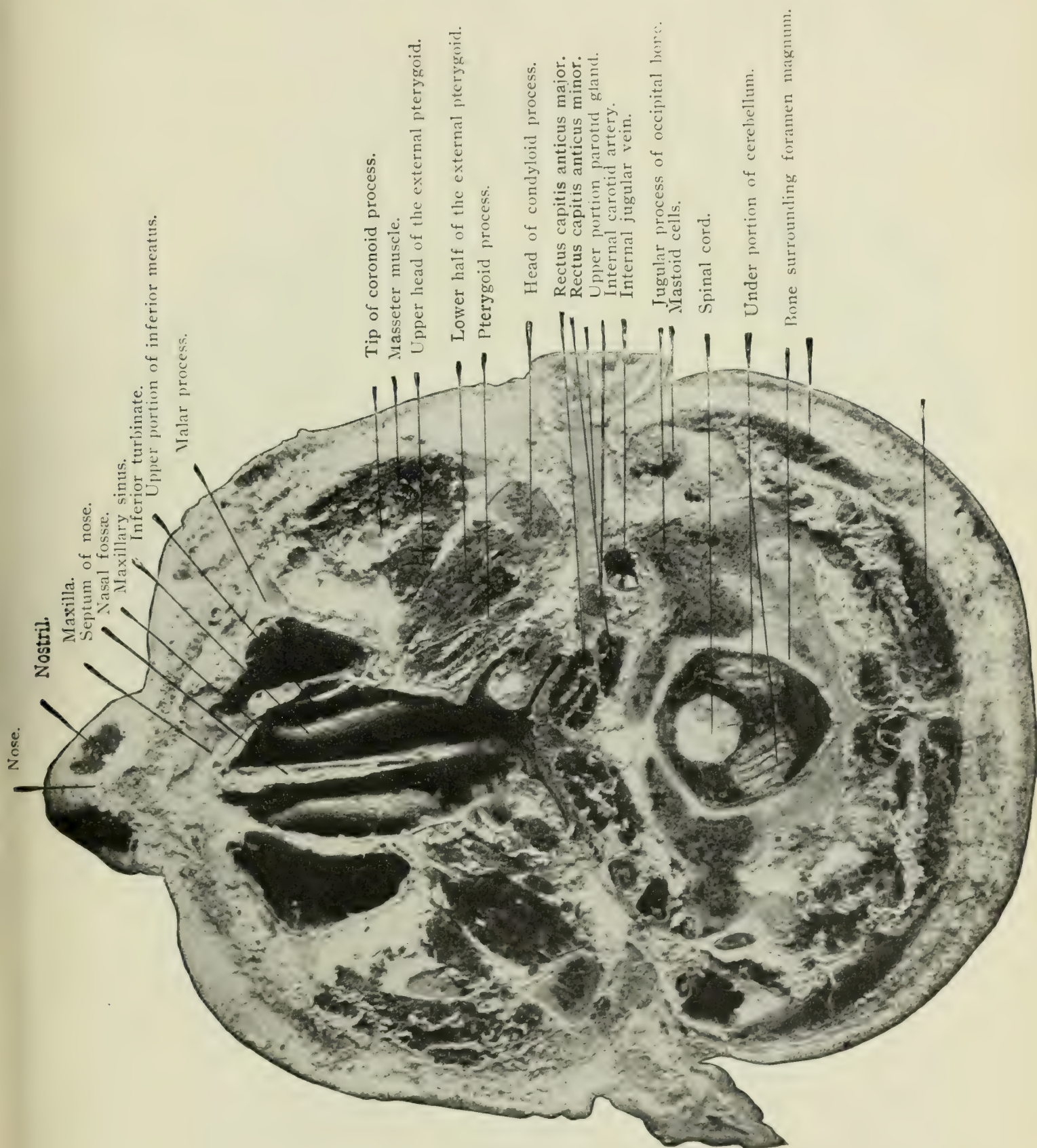
other. The soft tissues are so shrunk that it is impossible to form a correct idea of their natural size or conformation, or of their relation to the hard tissue. The tongue is very much shriveled, though it accords well with the description given in Gray's Anatomy, where the tongue is described as being "situated in the floor of the mouth in the interval between the two lateral portions of the body of the lower jaw." It is evident that the writer of this description

FIG. 2.



did his dissecting upon subjects in a somewhat similar condition to that from which this illustration (Fig. 4) was

Fig. 5 is a view of a section similar to that shown in Fig. 4, but as seen from the rear. It is cut in the same position,



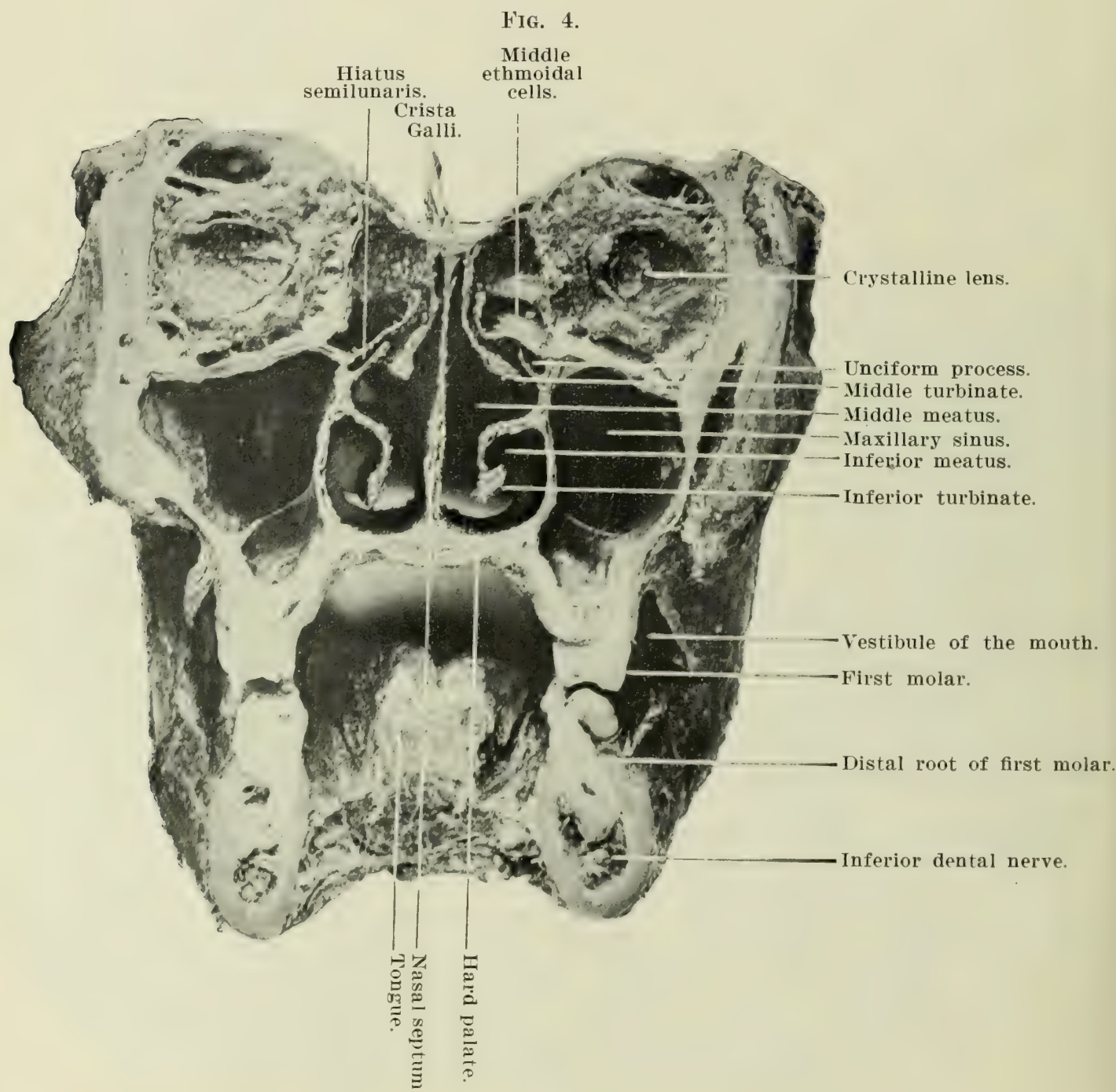
made. The tongue in the living subject with the mouth open lies naturally in the floor of the mouth, as the hyoid bone and all parts associated with it are drawn downward, as shown in Fig. 9.

but being made from a frozen section it presents quite a different picture, as the soft tissues are in as nearly a normal condition as it is possible to get them for illustration. In this particular indi-

vidual the frontal sinuses are very large and extend well down between the orbits. The left frontal sinus communicates directly with the maxillary sinus at the same side. A small wire indicates the channel of communication passing out

and one not very uncommon—is the cells within the left middle turbinate bone.

In the normal living subject the tongue, when the mouth is closed, almost fills the space from the floor of the mouth to the roof and from the pre-



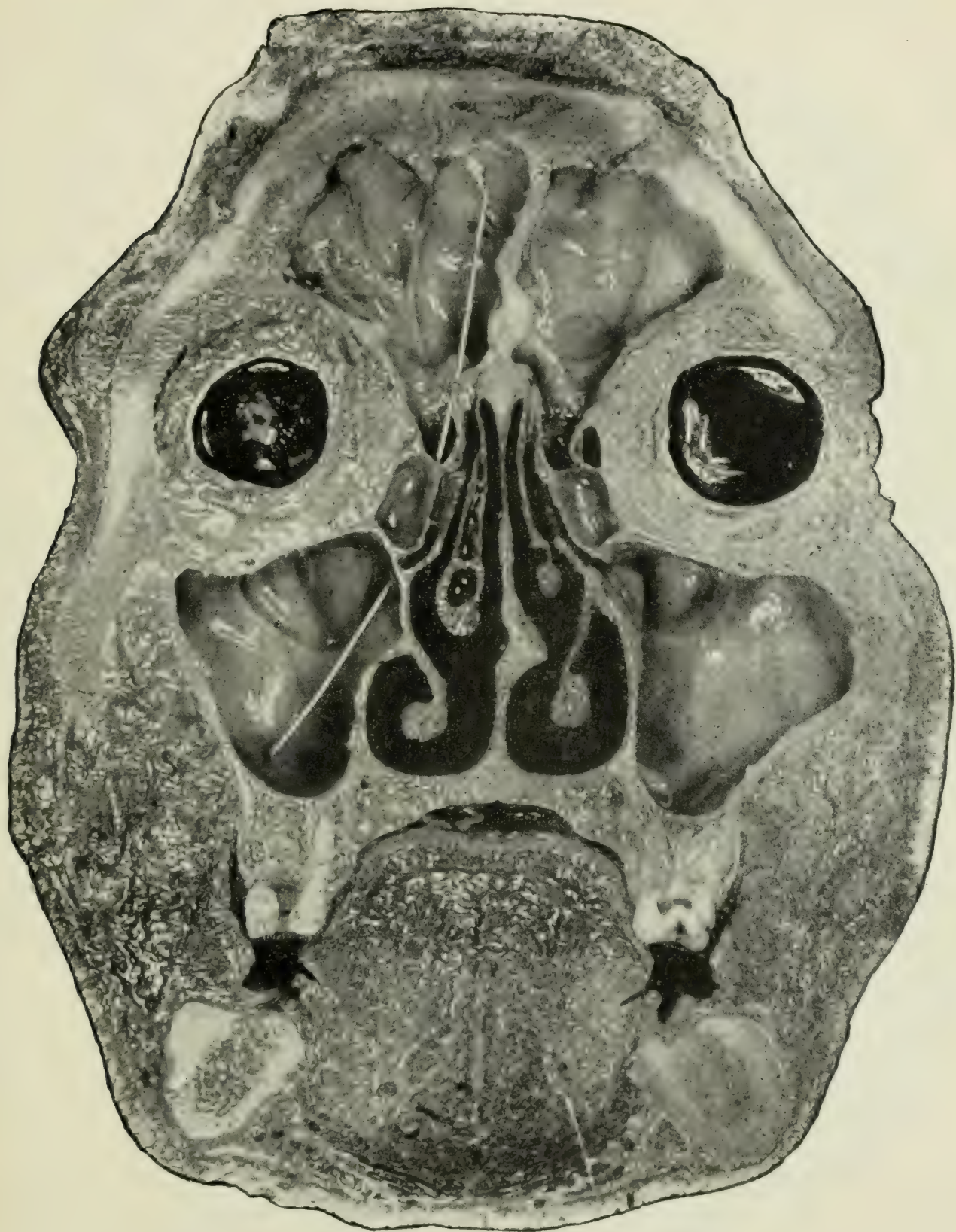
of the floor of the sinus into the infundibulum, then into the hiatus semilunaris and through the ostium maxillare into the maxillary sinus. It will also be observed that the floors of the antra are on a lower level than those of the nasal fossæ. There is also a spur on the septum with a deformed inferior turbinate opposite. Another interesting point—

molars and molars on one side to those of the other. So fully is the space occupied, that the sides of the tongue are more or less indented by pressure against the teeth, and the buccal surfaces of the cheek are in somewhat the same condition, though when the mouth is opened wide these indentations usually disappear. If a tooth be lost, the tongue and

cheek pass into or through the space, endeavoring to meet each other as shown in Figs. 5, 6, 7, and 8. This explains

tooth set in such a space seems abnormally large and uncomfortable, though in a short time the tongue becomes ac-

FIG. 5.



why the space left by extraction feels so large; the tongue does not come in contact with its usual resistance, but passes outward until it nearly meets the cheek through the open space. An artificial

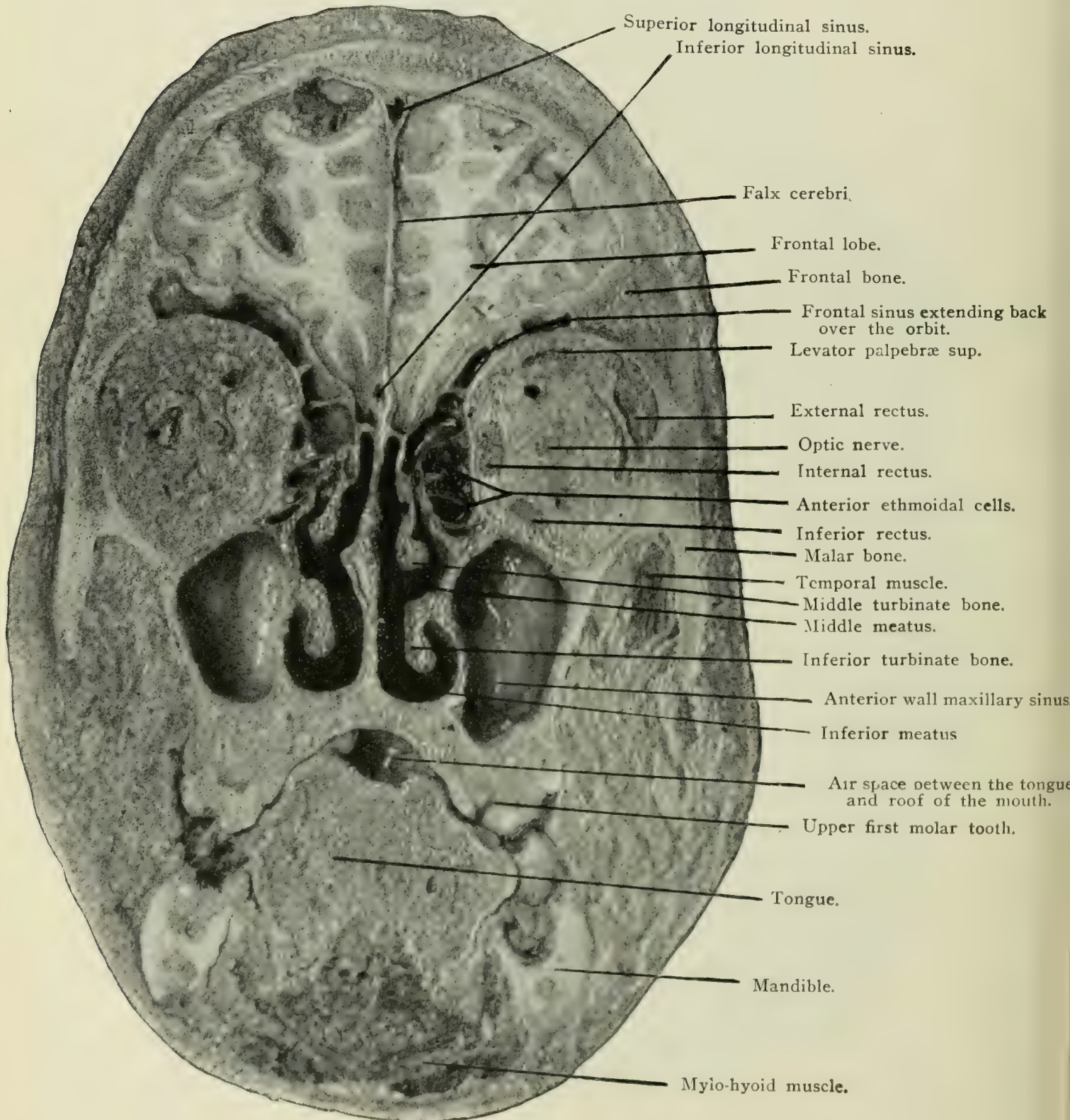
customed to it; in other words, the soft tissue recedes into normal position as before extraction.

In Fig. 5 the space between the tongue and the roof of the mouth is similar to

that shown in Fig. 2. In the cross section of the tongue will be noticed the raphe, the cross section of the blood-vessels, etc. The longitudinal section of

lo-hyoid muscles are nearly horizontal, while in Fig. 9, where the mouth was open when sectionized, the fibers descend downward and inward.

FIG. 6.



the mylo-hyoid muscles is shown with a portion of the submaxillary glands and the integuments below them.

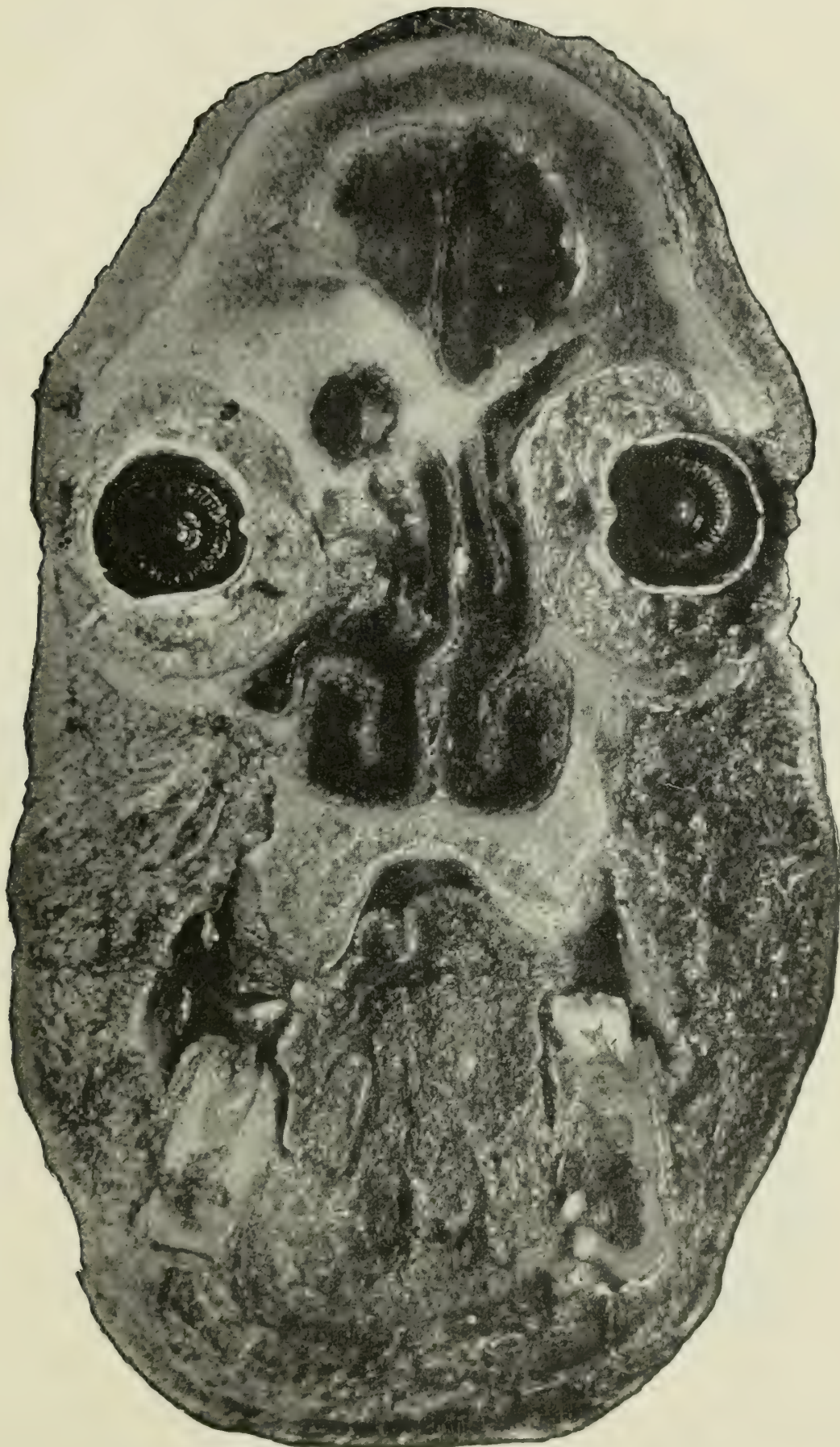
This section was cut with the mouth closed; the lines of the fibers of the my-

It is natural to suppose that the tongue, being so large and strong, would, through its outward pressure, have more or less influence in molding the shape of the alveolar arches; but, from exami-

nations of many vertical bilateral sections of the face, I would claim that the

the mouth. If a well-developed mouth with a full denture be examined, it will

FIG. 7.

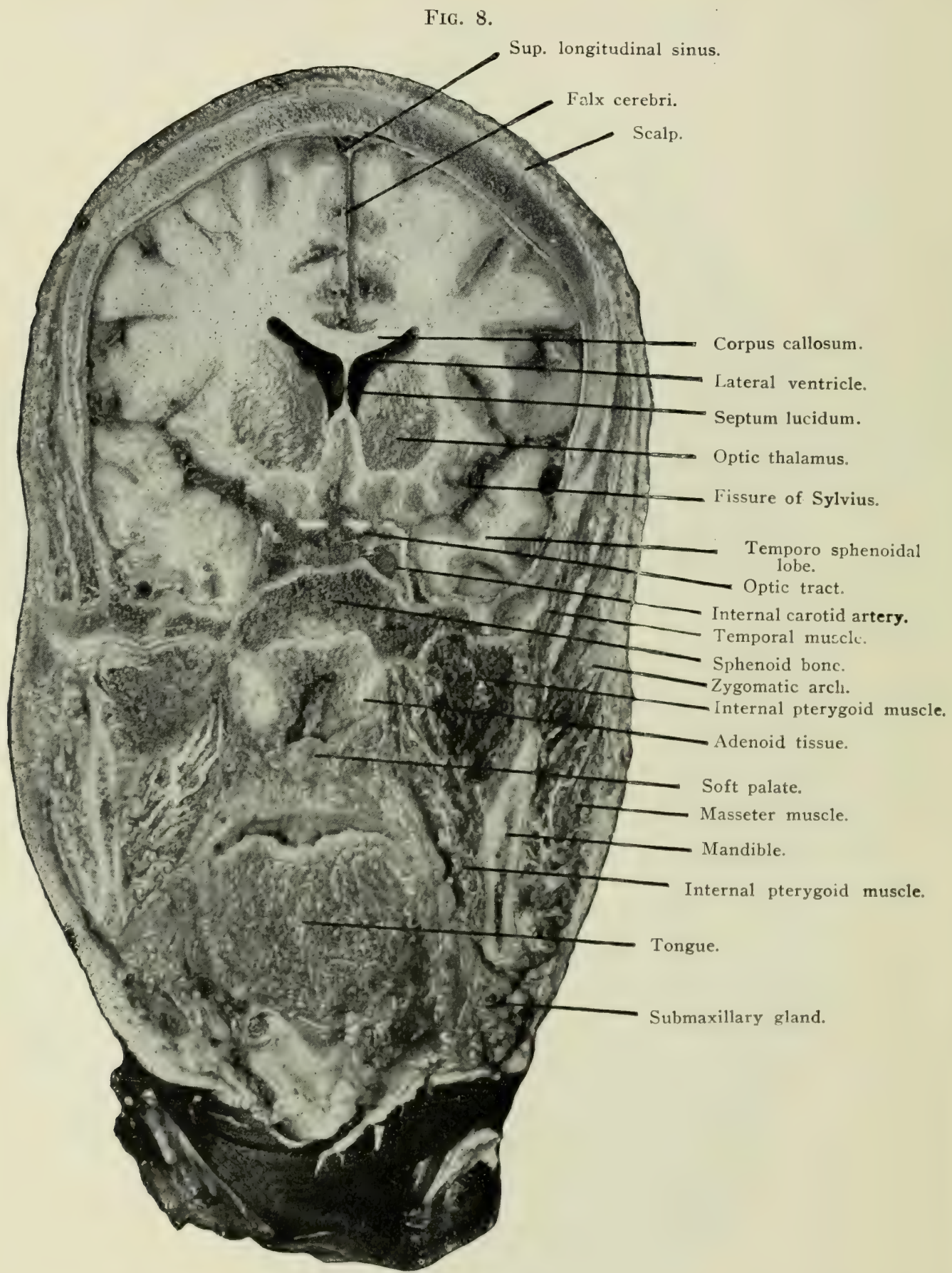


mouth has more influence in shaping the tongue than the tongue has in shaping

be seen that the outer surfaces of the tongue are smooth and conform to the

surfaces of the teeth and alveolar processes and the roof of the mouth. On

trate this point that Figs. 6 and 7 are introduced.



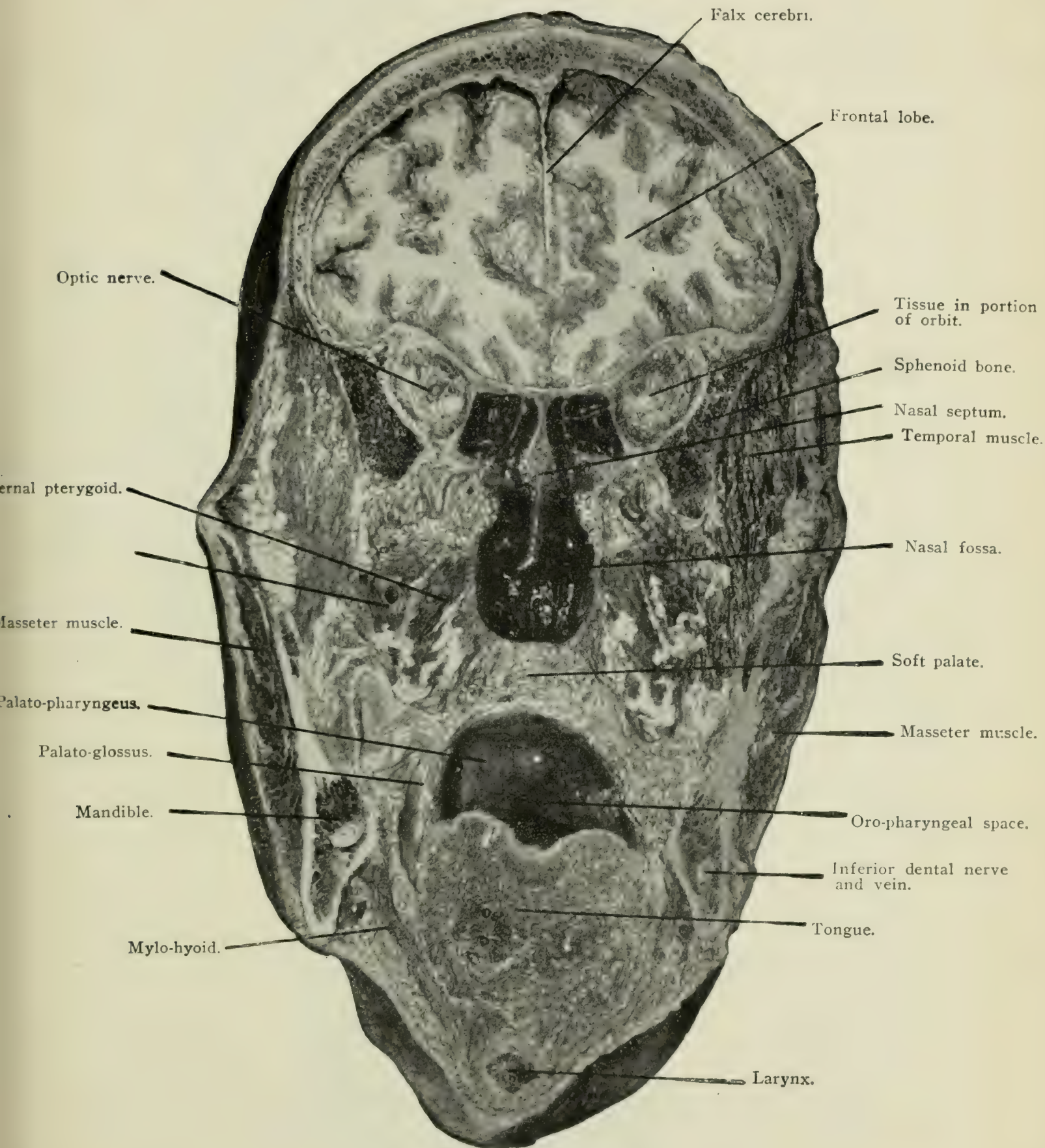
the other hand, in subjects who have compressed faces with narrow arches, the tongue will be irregular in its outline. It is in order to more thoroughly illus-

Fig. 6 is made from a vertical transverse section cut nearly in the same position as Fig. 5, but the view is from the front instead of the rear. The entire

head is more or less compressed, especially the upper and lower jaws. The

had sufficient power to force the alveolar processes outward. While looking at this

FIG. 9.



tongue has been more or less forced out of shape, showing that it has given way to the pressure of the walls, but has not

illustration it is well to note how far back over the orbits the frontal sinuses pass, with only a very thin plate of bone

between. The muscles of the eye are also well shown in cross section.

the face can be narrowed or compressed until the maxillary sinus of one side (the

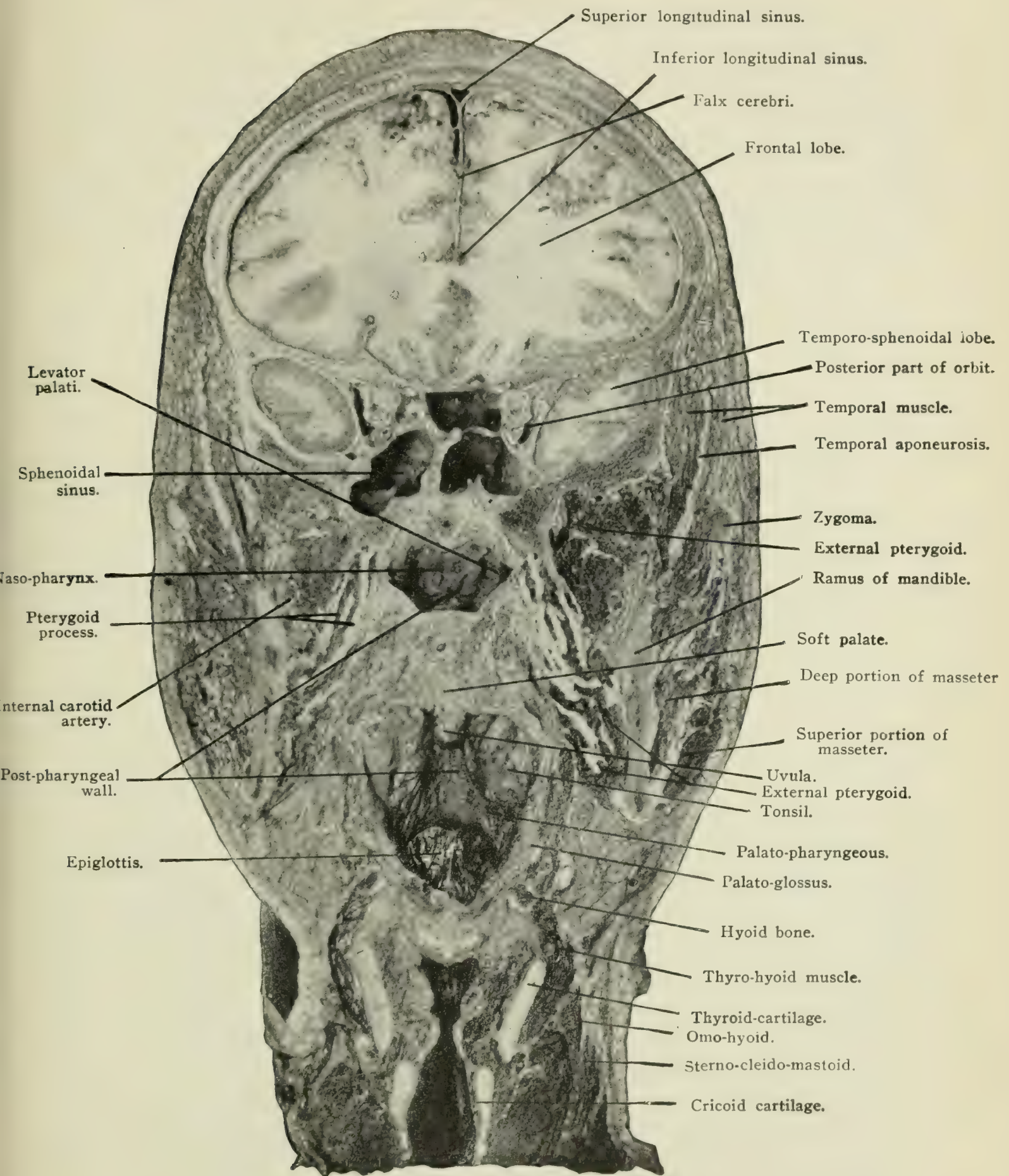
FIG. 10.



The next illustration (Fig. 7) is made from a similar section. It shows that

right) is lacking, while that of the other is only rudimentary, as it is found in

FIG. 11.



early embryonic life. The alveolar processes do not extend outward or downward in a curved direction as in Figs. 2

and 4, but descend almost vertically. The cross sections of the two sides of the mandible are closer together than in

Figs. 4 and 5. Through the narrowness of the mouth the tongue is much crowded and its outline is greatly deformed.

When the conditions shown in Fig. 7 exist, there will naturally be more or less interference with the functions of the respiratory tract within the nasopharynx. Adenoid growths are often found, as shown in Fig. 8. When these are very large and in this position, the sinuses of Rosenmüller become closed

the fibers of the mylo-hyoid muscles pass upward and outward to the internal oblique line of the mandible. If these muscles are kept on a tension and at the same angle, as shown in this illustration, the lateral halves of the mandible will be drawn toward each other and thus help to contract the lower part of the face. If this illustration be compared with Figs. 5 and 6 a great difference will be observed in regard to this muscle. It

FIG. 12.



and normal respiration cannot take place, consequently the person becomes a "mouth-breather." Besides the adenoids, this illustration gives a beautiful view of a bilateral section of the parietal lobes and the temporo-sphenoidal lobes of the brain, the corpus callosum, the lateral ventricle, etc.

The illustration Fig. 9 is made from a bilateral, vertical section cut in the region of the posterior portion of the hard palate. The subject had died with the mouth open, and it had not been closed before the section was made and photographed. The anterior portion of the larynx is shown. When the mouth is opened this becomes a fixed point. From near this region it will be noticed that

will be noticed in the illustration that the palato-glossus and the palato-pharyngeal muscles are also placed upon a tension, which narrows the distance between the right and left tonsillar spaces. The muscular action of these two regions, with that of the face, naturally influences the narrowing of the face,* as does

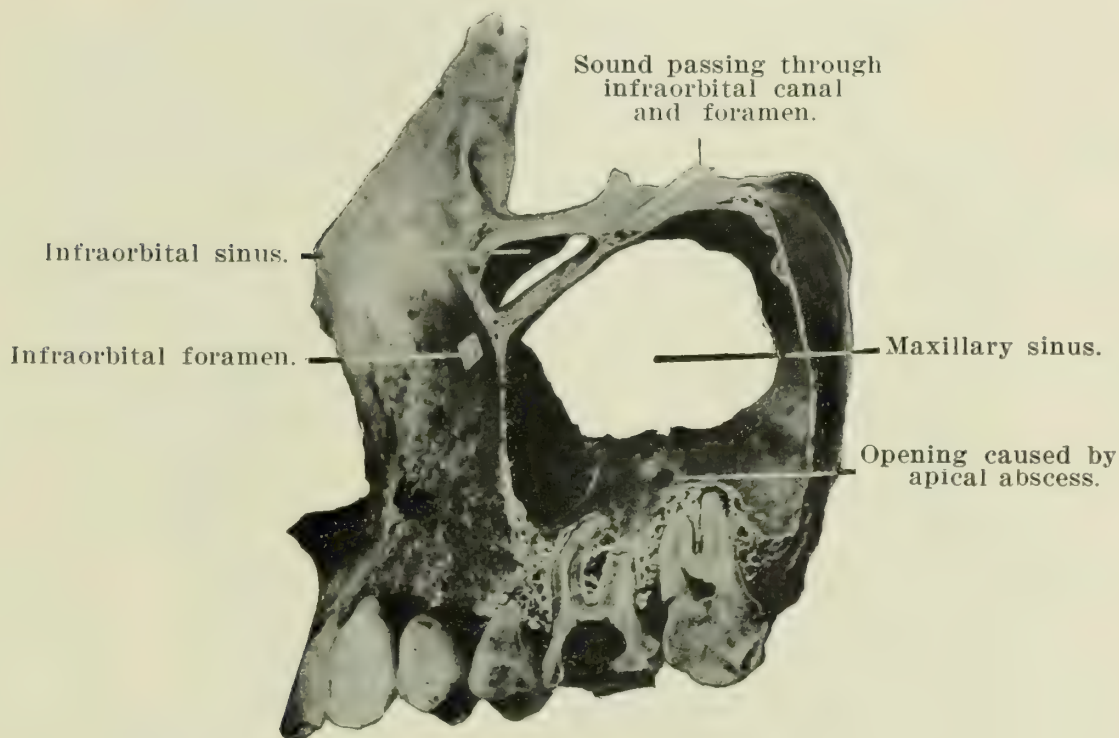
*The normal application of force to developing bone results in the normal development of the form of the bone. The abnormal application of forces under the same circumstances results in the development of an abnormal form. Abnormal applications of forces to bone in adult life will also change and modify its shape and character. The bones becoming changed, the whole body is modified according to the change in the bone tissue. (See "Studies of the Maxillary Bones," by M. H. Cryer, DENTAL COSMOS, November 1898.)

also the lack of percussive force of the lower teeth against the upper.

The illustration Fig. 10 gives a view of a transverse bilateral section showing the naso-pharyngeal space free from adenoids, the soft palate, the uvula, and the posterior portion of the tongue in position. It will be noticed how very close together the tongue and the soft palate come. Below the tongue and a little to one side a cross section of the hyoid bone

Fig. 12 is from a vertical transverse section showing the close relation of the roots of the molar teeth with the maxillary sinus. If a tooth of this character should become the seat of an abscess it is possible for the abscess to break into the antrum, and the infectious fluids would pass out through the ostium maxillare into the hiatus semilunaris. If the passage-way under the bulla ethmoidalis should be narrow, the infectious matter

FIG. 13.



will be observed, and below this again cross sections of the thyroid and cricoid cartilages, showing the inlet to the larynx and the trachea. If this portion of the tongue were removed, the tonsillar space would be brought into view, as shown in Fig. 11. In this illustration the uvula will be seen in the center, with the post-pharyngeal wall immediately below it. On each side of the uvula are the tonsils. At the bottom of this space the upper or anterior portion of the epiglottis is seen. Its general shape indicates how the fluids from the mouth are carried to the side of the pharynx.

In order to give the dental student a general idea of how infection from a tooth could pass to the upper part of the face and into the brain, the following illustrations have been introduced:

could inflame the lining membrane to such an extent that the normal fluids would become mixed with this infection, and thus the surfaces of all these spaces would be liable to become inoculated. Further, the cribriform portions of the bone between the upper part of the nose and the brain-case present so little resistance that the infection could be carried to the brain.

The next illustration (Fig. 13) shows a second molar well advanced in decay, with indications of an abscess which had broken into the antrum.

Fig. 14 gives a view of the maxillary sinus into which the probes have been passed through the ostium maxillare. The one passing upward goes through the hiatus semilunaris and the infundibulum and into the frontal sinus, indi-

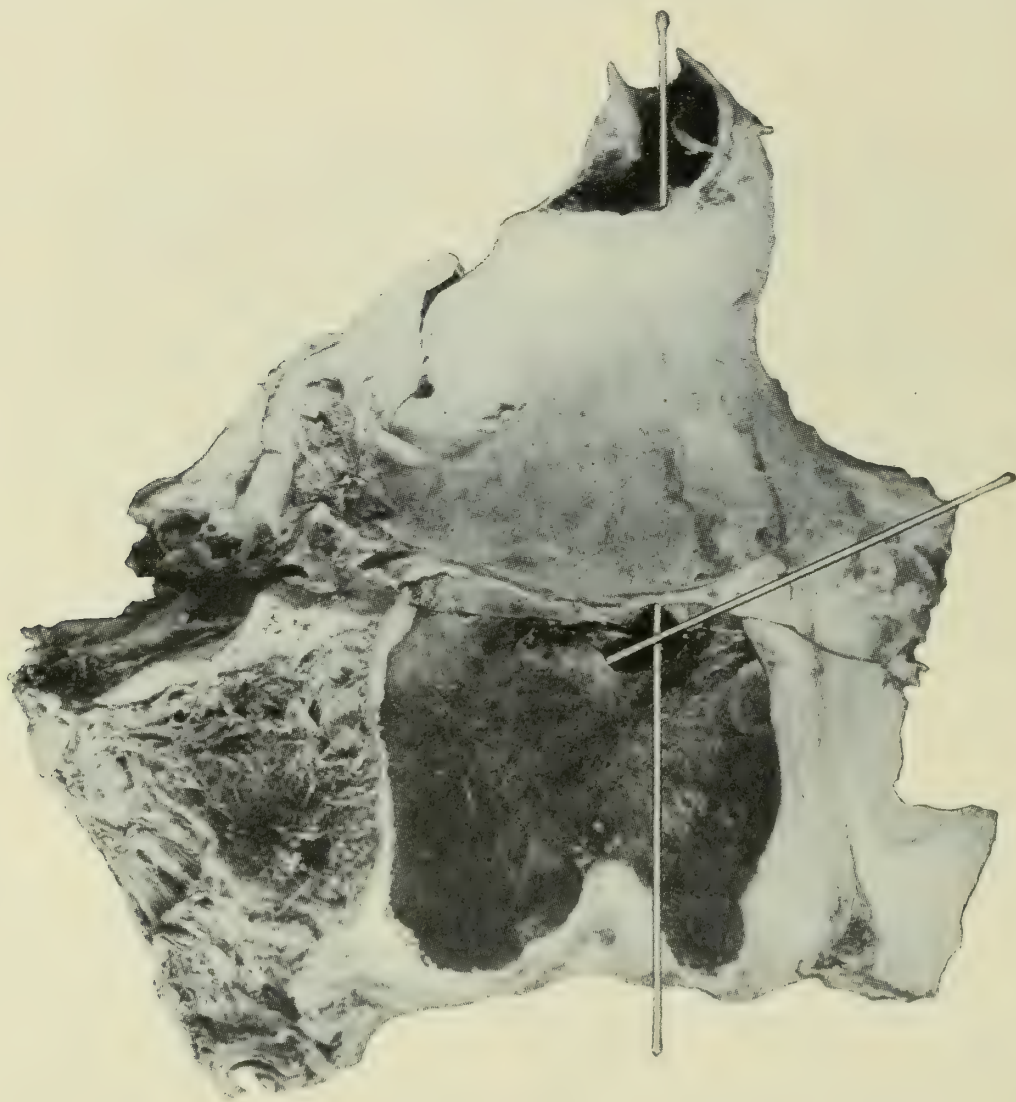
cating in this case a direct route between the two sinuses. This condition is also shown in Fig. 5.

Fig. 15 gives a lateral view of a nasal fossa with part of the middle turbinate bone and the coverings to the many ethmoid cells removed and turned up. This affords a view of the passage-way for the

Fig. 18 is from the same section as Fig. 17, but it has been divided through the center, again, showing the necrotic action which has taken place in the ethmoid cells.

Fig. 19, from the same specimen, also shows the floor of the anterior fossa of the brain-case to which disease had been

FIG. 14.



fluids from the frontal sinus, the anterior and middle ethmoid cells, and the antrum of Highmore into the middle meatus of the nose. It is at the point under the bulla ethmoidalis, the wall containing the middle ethmoid cells, where the passage-way is liable to become stopped up, as shown in Fig. 16.

Fig. 17 is from a horizontal section cut between the floor of the brain-case and below the floor of the orbit, showing where the inner wall of the orbit has broken down through necrotic action.

communicated through the cribriform plate of the ethmoid.

The next illustration is given in order to show how the brain tissue can be cut, when preferred, as described in this paper.

Fig. 20 is from a horizontal section cut through the center of the orbit backward through the various tissues, including the brain. It gives a horizontal section through the eyes with the tissues in the posterior part of the orbit. As the cut was made through the optic foram-

FIG. 15.

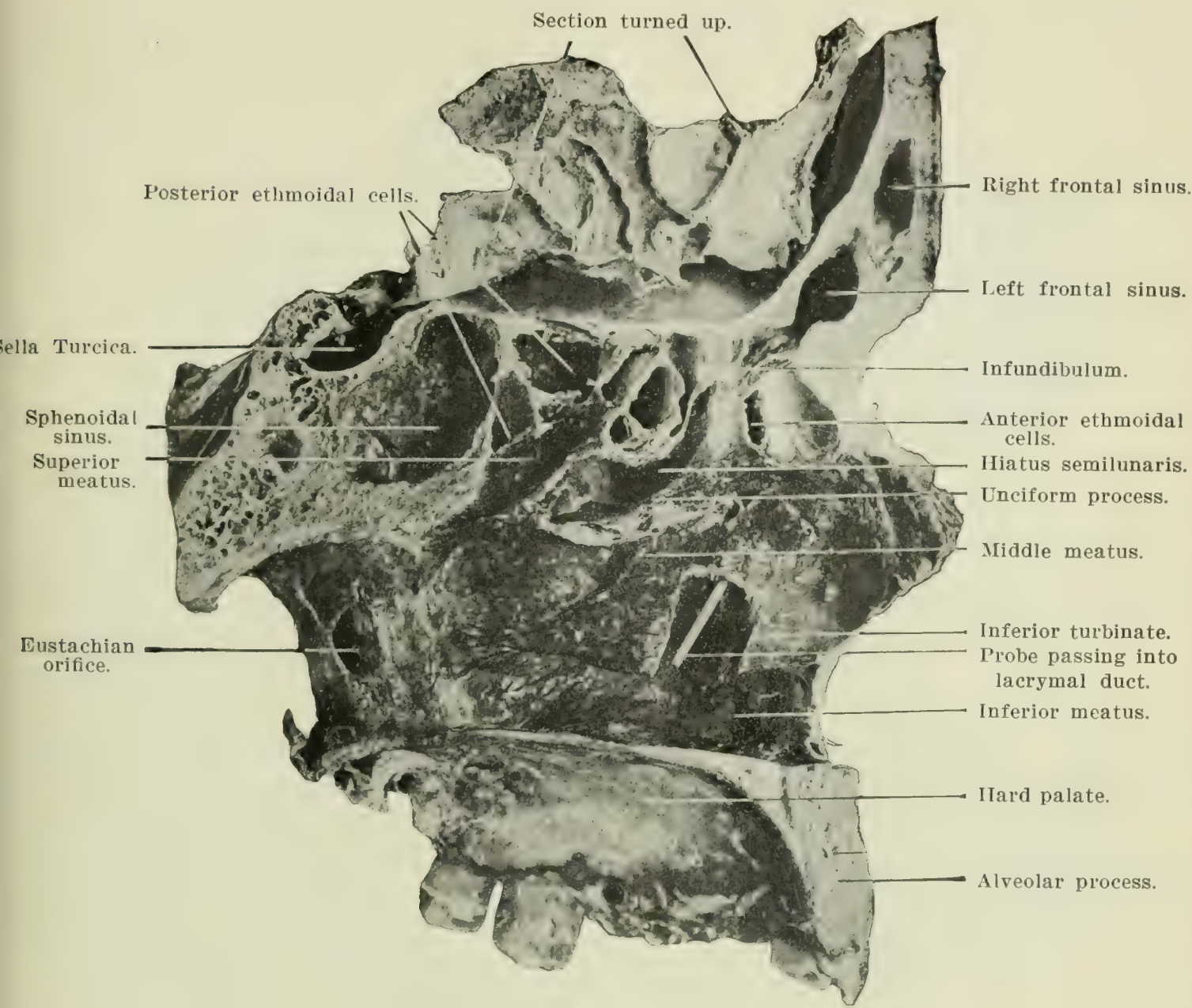
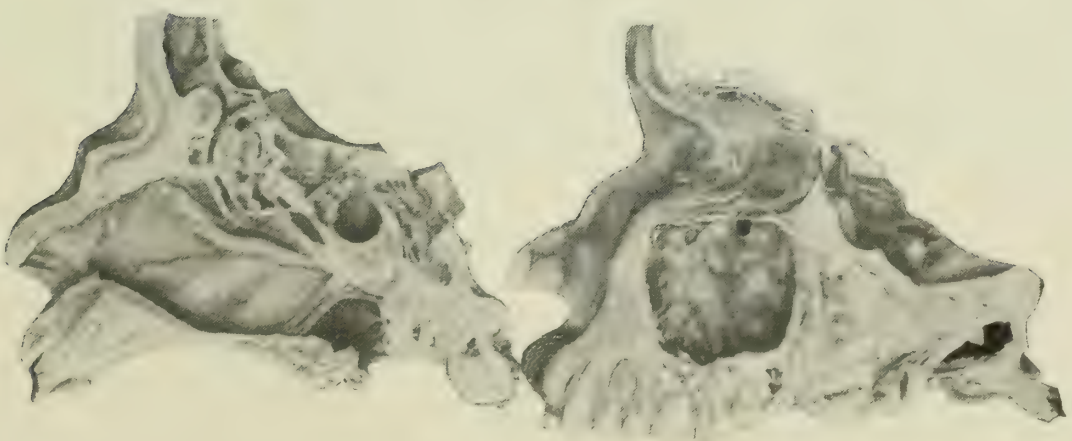
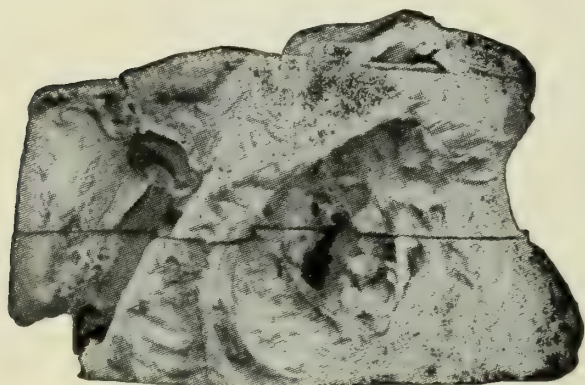


FIG. 16.



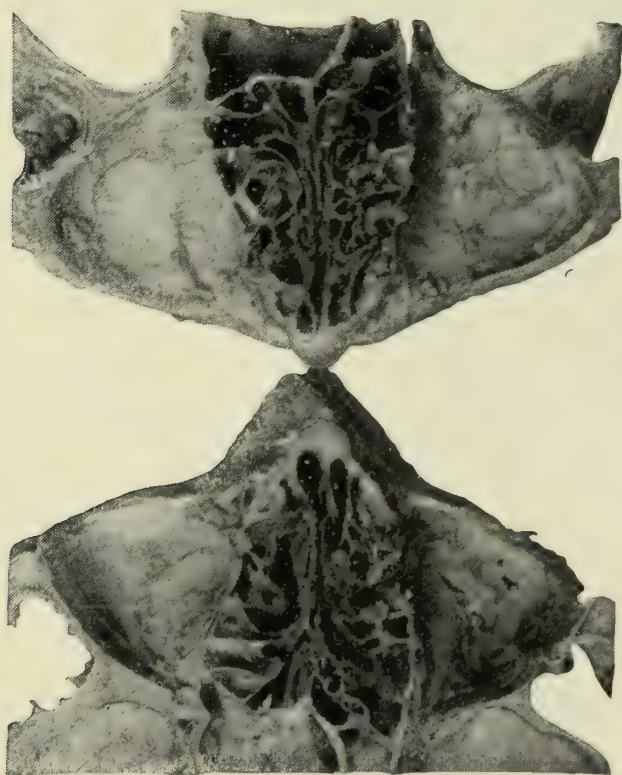
ina, it gives a view of a horizontal section of the optic nerves. This section also exposes part of the ethmoid cells connected with the upper part of the

FIG. 17.



nose. Various convolutions of the brain are shown; also a good picture of a cross section of the mid-brain, a section of the cerebellum, and of the edges of the ten-

FIG. 18.

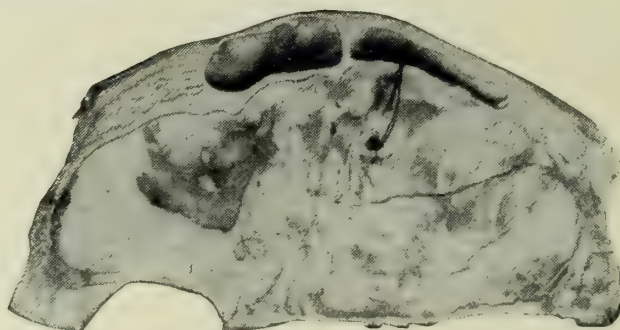


torium cerebelli, the straight sinus, the falx cerebri, and the longitudinal sinus.

The illustrations which have been shown are merely examples to enforce the advantages of this method of teaching anatomy as applied to dentistry.

The student becomes interested at once, which is a considerable advantage gained at the outset, inasmuch as it places him in a receptive condition. With the picture impressed upon his mentality he is in a position to compare and enlarge his recollection of the verbal description, and to discuss with his fellows the points illustrated and thus correct and clarify indefinite impressions. The teacher, on the other hand, is inspired, by the evident interest of the student, to present his subject in the best manner of which

FIG. 19.

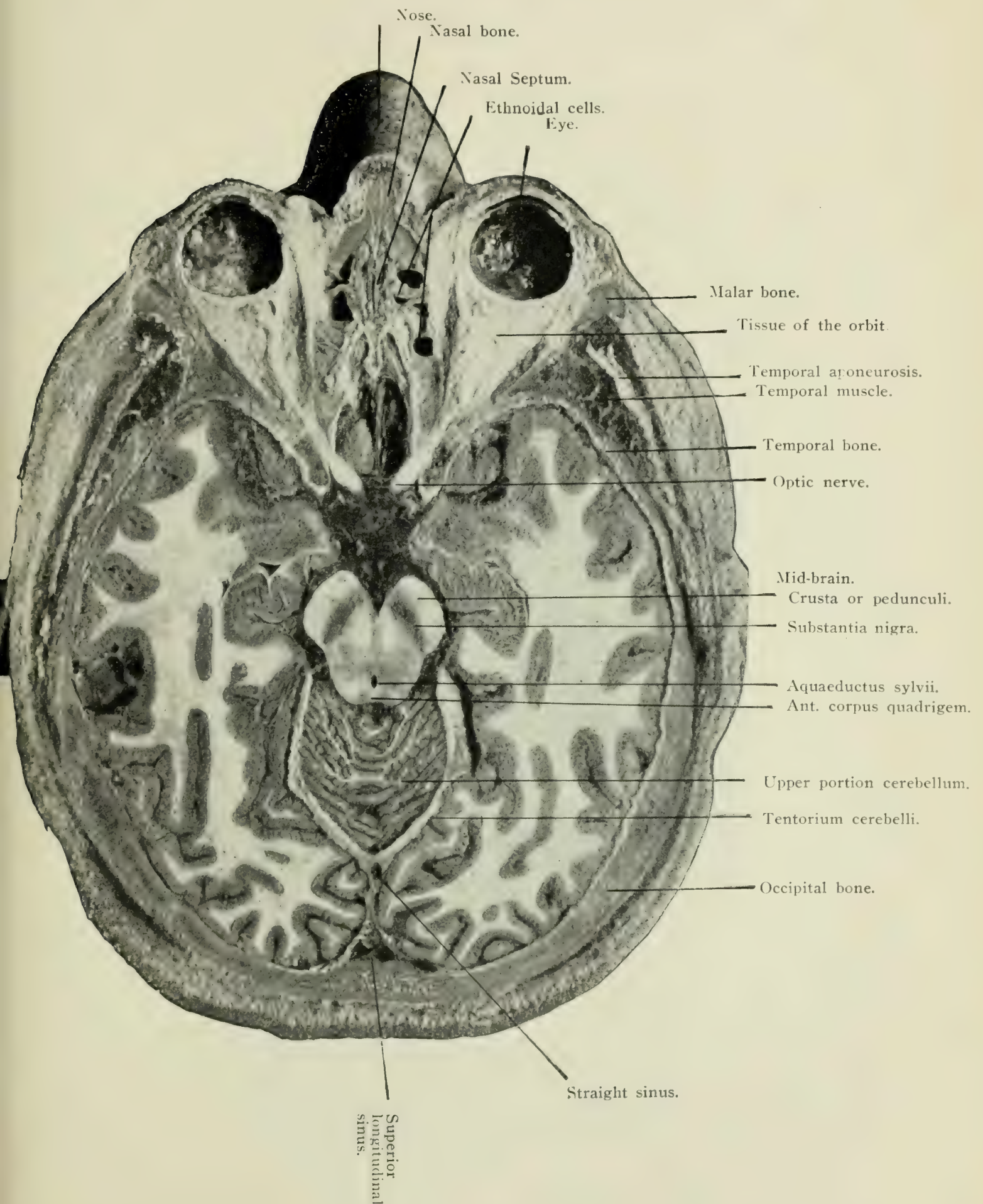


he is capable, action and reaction stimulating both. Not the least of the advantages of this method to the teacher is the ability to place all the points of the lesson distinctly before all the students simultaneously.

The slides constitute his book of anatomy—each slide a leaf; indeed, many are full chapters. They present the true anatomy—the true condition of the parts; the nearest approach yet made to placing in the hands of each student a specimen showing the parts under review. With a sufficient number of slides the teacher can lay out a course upon anatomy which can scarcely fail to “instill and install in the minds of his students clear, definite knowledge” that will be retained and will become an essential part of his working equipment as a practitioner.

NOTE.—For the reproduction of several of the illustrations—viz, Figs. 2, 3, 5, 6, 7, 8, 9, 10, 11, 20—we are indebted to the courtesy of *Items of Interest*.

FIG. 20.



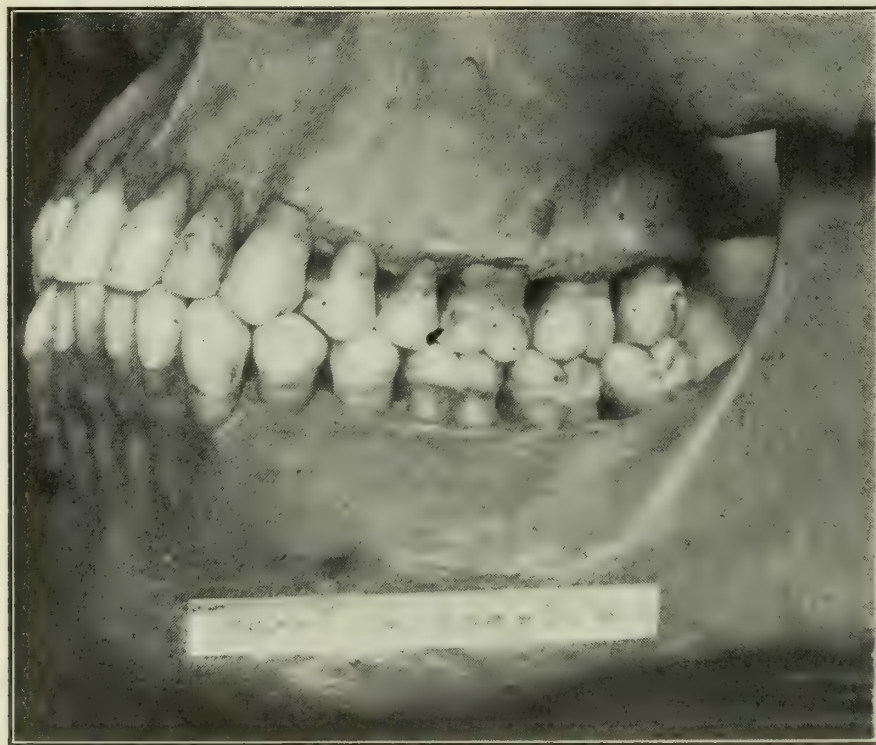
A PLEA FOR OCCLUSION.

By **RICHARD SUMMA, D.D.S., St. Louis, Mo.**

“**O**CCCLUSION is the basis of the science of orthodontia.” It has been proved beyond a possible doubt that it is absolutely necessary in correcting malocclusion of teeth (so-called “irregularity”) to establish not

scheme of nature whereby the best functional result has been obtained, while at the same time this mechanism acts to retain the organs of mastication in their correct relation. The inclined planes of the cusps formulate occlusion.

FIG. 1.



only a correct approximal contact of the malposed teeth, but also a certain relation of the occlusal surfaces of the teeth of the opposing arches which will tend to retain them in their corrected position.

Can anyone, even a casual observer, view the illustration here presented (Fig. 1) and hesitate but a moment before accepting the truth revealed thereby?

Are the inclined planes of the cusps of the molars and bicuspid mere chance? Are they functionless?

No, emphatically no! The interdigitation of the cusps has ever been the

Within the last few years the results of treatments of malposed teeth based upon occlusion have been described so profusely that it appears incomprehensible, to say the least, that only recently results obtained by the “at random” methods have been illustrated and upheld by arguments.

Most typical of these are the good pictures accompanying Dr. Kasson C. Gibson’s article in the September 1903 *Cosmos*, pages 699 and 700. Two of his illustrations are here reproduced for convenient reference (Figs. 2 and 3). In that

case the demands of occlusion received no consideration. Only a symptom, anterior protrusion, was recognized and treated. Anterior protrusion, in that

case after treatment show that that malocclusion was not corrected, hence the teeth cannot be expected to retain even the relation shown in the picture.

FIG. 2.



FIG. 3.



case, is but the expression in the anterior part of the maxilla of a malocclusion in the molar region. The models of the

Dr. Gibson succeeded in retracting the anterior teeth by closing the spaces that had existed in this region, but the nor-

mal mesio-distal relation was not established at any point. The scheme of interdigitation of cusps referred to in the opening of these remarks has not been brought about and therefore only failure can result.

It is to be regretted that no illustration of the profile after treatment accompanies the article, for it is quite evident that the effect of the abnormal overbite in the incisor region would find expression. And here I wish to emphasize that to do this work properly would require less time and impose less nervous strain than Dr. Gibson's process, and would certainly not demand an increased fee.

This brings us to the second part of my discussion, namely, the eloquent argument put forth in favor of these "at random" methods for treating so-called irregularities.

In the August 1903 *Items of Interest* appeared an article by Dr. J. B. Littig, in which that gentleman, after claiming thorough familiarity with the practice of orthodontia as based upon occlusion, and acknowledging the wonderful results achieved therewith, asks, among other questions: "Will the evidences of appreciation be sufficient to warrant us in carrying out such extensive operations?" and, "Will the patient be able to give sufficient recompense for the number of visits which will be necessary during the more prolonged treatment?"

I respectfully beg to differ with the doctor. Such arguments are under no condition admissible. First of all, the doctor's arguments permit the inference—which I do not consider applicable to his own practice—that in orthodontia two grades of work can exist—the more

perfect for the patient who can pay, and the more imperfect for the patient who cannot pay.

Suppose the surgeon in performing an operation were to do his work less thoroughly because the patient can pay but little; suppose the dentist were to make a gold filling less perfectly because the one patient cannot pay as much for the work as the other; would such excuse render them morally and legally less liable? Professional services—above all—cannot and must not be graded according to the ability of the patient to pay. Whenever we are cognizant of the best result and how to obtain it, we should never set out to accomplish but a "fair" result.

I also wish to controvert Dr. Littig's argument that teeth forced into alignment without extraction for space are more difficult to hold in their new position, for there can be no better retainer than nature's own normal occlusion.

The remainder of the doctor's arguments plead so forcibly for placing this work in the hands of specialists that I must express my gratitude. The nervous strain upon a specialist in doing this work is evidently much less than the nervous strain occasioned to a busy general practitioner in achieving a "fair" result.

In regard to the appreciation of good results, let us be mindful of a thought that must appeal to all true artists: "Art is the expression of man's joy in his work." The joy of having produced a permanently beneficial result in anything that is at all worthy of our undertaking is sufficient recompense. Therefore, let us do our work as well as we can.

A NEW PORCELAIN ENAMEL FOR CROWN AND BRIDGE WORK AND CONTINUOUS GUM.

By N. S. JENKINS, D.D.S., Dresden.

(Read before the Section on Odontology and Stomatology, Fourteenth International Congress of Medicine, Madrid, April 23, 1903.)

WHEN porcelain for inlays had been brought into a satisfactory condition, the question of adapting it to other purposes naturally arose. It was found that it could be used for attaching porcelain crowns to pivots and for small pieces of bridge work, but that it needed to be used with much caution, since its great density, when melted to its most compact condition, made it incompatible with the weaker porcelain of artificial teeth, so that it could easily crack and become thus defective through very excess of virtue. For inlay purposes density and strength are essential. These qualities are only attainable in their highest degree through a body which has been so treated that it possesses a certain homogeneity, and which, in its final fusing, is not of one structure above and another below, but which throughout is of equal quality and temper. Such a body must shrink in fusing, as otherwise it cannot obtain sufficient solidity. Those bodies for dental purposes which shrink so slightly that they can be finished in two fusings are too weak in structure to be used safely, except in considerable mass. For that reason the advocates of high-fusing bodies for inlays are chary of using them in positions where much strain is brought to bear, as in such places they are liable to crumble.

But, as porcelain enamel, with its incomparable strength, had still the defects of its qualities, it was evident that a special porcelain enamel must be evolved for crown and bridge work and continuous gum—one which should have something like the density and strength of porcelain enamel for inlays, and yet could be fused upon platinum and porce-

lain teeth without showing cracks, bubbles, or blow-holes. To this problem my laboratory has been devoted during the past year, and I have now the honor of presenting to you the completed results of a long series of careful experiments.

The body now presented, like all true dental porcelains, is built upon the foundation of feldspar, kaolin, and silica, with various fluxes and metallic oxids, and has been subjected to elaborate and complicated treatments, the sum total of which, while bringing down the final fusing-point to easily manageable conditions, has also made it possible to obtain such a degree of homogeneity as to give great strength and density together with efficiency. The treatment of the unusually high percentage of kaolin which was found necessary presented many difficulties, and the use of three different kinds of feldspar was indispensable.

This body must not be confounded with porcelain enamel for inlays, for it is designed only for its special purpose—that is, for crown and bridge work and for continuous gum. By its use the gleam of gold in the mouth can be completely avoided, unless in some cases of plate work a small platinum-gold clasp may be necessarily visible.

The first requisite for crowns and bridges is that they should be able to endure, without injury, all ordinary use. Where, for esthetic reasons, it has hitherto been necessary to employ gold and porcelain in this work, the dentist has been obliged to rely chiefly upon the platinum pins in the artificial tooth to retain it in position uninjured, and the frequency of accident has been sadly

familiar to us all—a frequency which has given rise during late years to many ingenious devices for repair without ruining the whole work. Moreover, a glaring display of gold has often been unavoidable. Now, however, by the aid of the new porcelain enamel, crowns and bridges can be made, upon a platinum base, which are stronger and less liable to accident, more cleanly and more beautiful, than anything which has preceded them. The soldering of the base can be done with pure gold, which is distinctly easier to manage than platinum-gold solder. To be sure, the new porcelain enamel melts at a somewhat higher temperature than is necessary for inlays, but it still fuses at a degree sufficiently below the melting-point of gold to preclude all danger of weakening the metal work by the remelting and flowing of the pure gold solder. It is so strong that a piece of continuous gum one centimeter square and two and one-third millimeters thick will endure a crushing force of 590 kilograms. A piece for crown and bridge work of the same dimensions will bear a strain of 745 kilograms. Indeed, it seems impossible to injure it except by a blow. It unites perfectly with porcelain teeth of every make, but it is especially useful in combination with English teeth, which possess something like its own density and strength. It can be ground to occlusion and then admirably polished without danger of subsequent discoloration, or it can again be put in the furnace and reglazed. This density permits grinding and polishing, which, as in the case of porcelain enamel for inlays, is a feature of great importance, and which is not possessed in anything like the same degree by any other dental porcelain, except by some English teeth.

And here I wish to make a digression, which is, however, germane to the subject under discussion, to explain an improvement of great interest and importance in porcelain restoration, made by an English colleague, Mr. Mellersh of Surbiton. It consists of a fine, wedge-shaped core, or backbone, of English dental porcelain, which being placed in

position in the matrix, when a corner of an incisor is being built out, serves as a guide for shape and contour, especially for the cutting edge. It is usually placed after two meltings have occurred, and when as yet no attempt has been made to form the contour. It is then set in the middle of the matrix, wet with porcelain powder, and fused. This gives an unyielding ridge, which serves as a backbone, against which the desired contour can be formed and the edges defined with exactitude. Porcelain enamel unites perfectly with English dental porcelain. The small bulk of the latter renders the slight difference in strength of no importance. These cores can often be used to give an underlying depth of color, as they are furnished not only in light, but also in deep shades. When finished the cutting edge can be shaped, if necessary, with sandpaper disks, to exactly the line required, as both core and porcelain enamel can be ground and polished with impunity.

In conclusion, the advantages of the new porcelain enamel for crown and bridge work and for continuous gum consist in its great strength, the ease with which it can be manipulated, its low fusing-point, which permits the use of pure gold solder for the platinum base, and the fact that it renders the employment of English teeth possible for crown and bridge work and continuous gum. All the standard teeth have their respective virtues; no words can express what we owe to the efforts of the great manufacturers to supply us with such wonderful substitutes for the natural organs. Form, color, density vary according to the methods of the manufacturer and the end he has in view. No dentist in broad practice can ignore any standard manufacture or confine himself to any one product. If my experiments have seemed to show how English teeth can be utilized in a class of work from which, by high-fusing methods, they have hitherto been excluded, it is only an incident in the broadening of that field of knowledge from which the profession and humanity must surely profit.

PHOSPHOR NECROSIS.

By Dr. W. KELSEY, Marseilles.

(Read before the Section on Odontology and Stomatology, Fourteenth International Congress of Medicine, Madrid, April 23, 1903.)

THOUGH phosphorus had already long been known to toxicology, the peculiar action produced upon the human organism by the gradual absorption of its vapors was not remarked previous to 1839, five years after the introduction of lucifer matches into Germany.

Public attention was first called to this disease in 1845, by Lorinser and Heyfelder, who, after a long period of independent research, announced the results of their observations nearly simultaneously. This affection is confined almost exclusively to workpeople employed in the manufacture of friction matches, a peculiarity attributed to the emanations of phosphoric acid unavoidably inhaled in the workshops. The malady may manifest itself as early as a few months after entering the laboratory, and according to Riedel it has been observed as late as seventeen years after the occupation had been entirely abandoned.

A long contested point with regard to phosphor necrosis was whether it was a local affection, or merely a local manifestation of an organic trouble.

In 1872 Wegner* published the result of a series of experiments upon animals, to which he had administered increasing doses of phosphorus for varying periods of time. He particularly remarked the changes produced upon the maxillaries. The bones were distorted, the soft portions were tumefied by caseous infiltrations, and the jaws became fixed, these changes being still more marked when attended with caries of the teeth or erosion of the mucous membrane. As these phenomena were observed in ani-

mals, it was naturally assumed that similar effects would be produced on human beings under like conditions.

The inference was that the frequency of necrosis among persons exposed to the emanations of phosphorus should be attributed to functional derangements attendant upon a long-continued and gradual absorption of phosphoric vapors. Roussel* maintained that the decay of one or more teeth was the indispensable condition for the development of the disease of the maxillaries; whilst Trélat insisted that in certain exceptional cases there was a perfectly healthy condition of the teeth when the first symptoms of the affection were remarked.

This theory was first advanced by Strohl in these words: "The saliva, impregnated with phosphoric vapors, penetrates through the interstices of the teeth to the gums and periosteum."†

Magitot‡ maintained that a dead tooth was always the precursor of necrosis, the contamination in the roots serving as a vehicle for transmitting the phosphoric agents to the periosteum, provoking alveolar periostitis, which thus became the starting-point of the trouble.

A better explanation is given by Dr. Arnaud of Marseilles§ in these words: "Phosphor necrosis is the sequel of an infectious osteo-myelitis of the maxillæ, of which the most common mode of penetration is found in an affection of the teeth or alveolus, or through a dental operation, favored by the general and local action of phosphorus upon the nu-

* *Revue méd.*, March 1846.

† *Gazette méd. de Strasb.*, 1845.

‡ "La Nécrose Phosphorée," 1888.

§ "Etudes sur le Phosphore et Phosphorisme," 1897.

* "Der Einfluss des Phosphors auf den Organismus.

trition of the osseous elements of the maxillæ, and it develops itself exclusively upon subjects in a receptive condition, in consequence of previous or acquired pathological conditions, or simply aggravated by the phosphoric taint."

It is generally known that phosphorism is characterized by disturbed functions of nearly every organ of the body. The respiratory passages are in a state of constant irritation; the digestive functions are impaired; the nervous system is affected, the kidneys secrete an abnormal quantity of urine impregnated with an excess of urea and albumin, with traces of phosphoric acid; the patient is nearly always anemic; otitis and ophthalmia are frequently observed, the skin is subject to eruptions, and even the exhalations of the body have a characteristic garlicky odor never to be mistaken when once perceived.

When the functions of the body are thus disturbed and the most elementary rules of hygiene are ignored, caries of the teeth is almost invariably present, and the local action of phosphoric acid greatly hastens the decay. Tested with litmus the saliva frequently shows an acid reaction. From decay to nerve exposure is but a step, and when once supuration sets in, necrosis is to be feared with all its dread sequelæ. The timely treatment of a decayed tooth might have averted the danger, but once the disease declares itself the extraction of the offending organ will neither arrest the progress of the malady nor relieve the pain.

The gums inflame, swell, and ulcerate, whilst the pain may become excruciating. The salivary glands secrete an unusual quantity of saliva, and fetid pus issues from the fistulas which form in the mouth or appear externally. Bright's disease, bronchial irritation and marasmus frequently supervene in quick succession. Now, the deadly germs finding their way to the stomach and lungs, engender infectious pneumonia; again, invading hosts of micrococci, streptococci, staphylococci, and all their vile lineage reach the advance defences, attack the bastions of the brain, and cerebro-spinal

meningitis with certain death ensues. When once established the malady is very dangerous, different authorities having estimated the mortality at from ten to twenty per cent., or even as high as fifty per cent. when both jaws are affected.

Several cases of partial necrosis with exfoliation, and one severe case with the loss of the greater portion of the inferior maxilla, fell under my personal observation at the Marseilles factory. Except that the reparatory process was less prompt, they usually followed the normal course of necrosis. In nearly every instance there was total disregard of all rules of hygiene, with the natural concomitants of salivary calculus, carious teeth, irritated gums, and the characteristic purplish line at the gingival border. After the removal of all local causes of irritation, the frequent use of an antiseptic mouth-wash, and a too often unheeded injunction not to spare the brush, these symptoms in most cases rapidly subsided. The medical treatment usually recommended is a milk diet to facilitate renal elimination, and as much fresh air as possible in order to oxidize the particles of phosphorus contained in the system, together with such other remedies as may seem appropriate in relieving certain peculiar symptoms: Sodium bicarbonate to correct the acidity of the saliva, potassium iodid, or turpentine—in consequence of a reputed, but not well understood action it has in counteracting the toxic effects of the vapors—are also sometimes prescribed. It is not my province to discuss at length the surgical treatment, which often implies the most heroic operations, resulting, when successful, in deformities that the most skilfully made prosthetic appliances are unable to correct. Suffice it to say that there is some diversity of opinion concerning the advisability of surgical interference when the patient already shows evidence of phosphoric poisoning, for fear that such intervention might open the door to microbic infection and precipitate the malady it was expressly intended to avert.

The treatment should be in a great

measure expectant, as the diagnosis of the malady can never be affirmative until the appearance of the sequestrum. Antiseptic mouth-washes and injections of phenic or boric acid, or beta naphthol 25 ctgm. to one liter of water distilled and boiled, or potassium permanganate 6 gm. to the liter, can be employed advantageously, ten drops in a glass of water.

Dr. Vallin says: "All intervention should be avoided, or postponed until proper hygienic conditions and a sufficiently long absence from the factory has permitted the poison to be eliminated."*

No one has ever ventured in ordinary practice to oppose so simple an operation as the extraction of a tooth upon the ground that such action might produce necrosis; on the contrary, we all insist upon the danger of retaining incurable teeth, and can cite instances where the neglect of this prescription has entailed the most serious consequences.

There are radicals and Tories in medicine as well as in politics. If we admit with the former the danger of interference, we at least are forced to recognize with the latter that procrastination gives no guarantee of immunity. My personal experience leaves me somewhat uncertain in which camp to plant my standard. I have operated on scores of workpeople suspected of phosphorism with excellent results except in one or two notable instances.

The first of these was that of a woman forty years of age, who presented herself at the factory clinic for an apparently simple operation, the extraction of an isolated lower molar. To my great chagrin my efforts only succeeded in breaking the tooth even with the process.

A recognized effect of phosphorus upon the inorganic system is in increasing the density of the osseous tissue, thus rendering the bones extremely brittle and liable to fracture from the slightest causes, and it has seemed to me that even the teeth sometimes show evidence of hyper-calcification. Be this as it may, as was customary after even the simplest operation which entailed cicatrization of

the wound, the woman was advised to temporarily quit her employment. Acute inflammation immediately set in about the root, continued, and abundant suppuration followed, and in a few weeks the root, which had defied my efforts to remove it, was exfoliated, a speedy cure following the elimination of the sequestrum.

The other case, that of Marie R., aged twenty, anemic but presenting no definitely characterized malady, developed much more serious complications. The young woman complained of a slight glandular swelling and severe pain in the infra-maxillary region, which had been aggravated by the unsuccessful attempt of a fellow practitioner to extract the incriminated tooth, a lower left bicuspid. With no hesitation I took an alveolar forceps, and forcing it well down, removed the root with little difficulty. A slight fracture of the alveolus was naturally unavoidable. Instead of giving any relief, the operation seemed rather to have added fuel to the flame. The pain and swelling increased and necrosis was speedily diagnosed. Sequestra were formed and eliminated, with their corresponding teeth, until, after a few months, of the lower teeth only two molars were left—like seared trunks after a forest fire—to tell the tale of the suffering the poor girl had endured. There was naturally some disfigurement, which after her ultimate recovery was partially corrected by the insertion of an artificial denture. The right half of the superior maxilla is still, three years after the first symptoms of the malady, slightly affected; a fistula exists at either side of an apparently healthy canine, though no sequestrum seems to have formed, and the patient appears otherwise to have regained her former good health.

One point little dwelt upon in connection with this disease is the question of heredity. It is, however, generally admitted that there is a more than average mortality among the children of contaminated parents. Does this imply that phosphorism, like tuberculosis, alcoholism, and kindred complaints, engenders a predisposition to certain ailments and

**Bull. de l'Académie de Méd.*, 1897.

a lack of resistance to their attacks? Without attempting to answer the question I wish to relate a little incident: One day, whilst treating the daughter of a woman who had worked in the factory for upward of a quarter of a century, I noticed upon her gums at the necks of the teeth the peculiar purplish stigma already alluded to. Naturally inferring that it was due to phosphoric influences, I asked how long she had been in the factory, and was somewhat nonplused to learn that the daughter was a milliner. It is presumably an indication of functional disturbances, aggravated by the accumulation of tartar and the direct action of phosphoric vapors, but apparently may exist independently of the latter influence.

If necrosis cannot appear without previous infection, it is evident that a perfect dentition is an almost certain guarantee of immunity from this disease. With decayed teeth, necrosis is always to be apprehended when phosphorus is employed in its ordinary condition. The danger can, however, be minimized, or even averted, by properly enforced hygienic regulations, perfect ventilation, and careful treatment of all incipient caries of the teeth, together with obligatory dental surveillance and a preliminary inspection before entering the factory. Dr. Courtois-Suffit says: "The obligatory visit has caused the *mal*

chimique to entirely disappear from the factory in Pantin."*

Strange to say, the compulsory visit met with violent opposition from the employees themselves, in consequence of the indemnities paid by the French government to those who were incapacitated from work for any cause pertaining to their employment. A decayed tooth was sometimes a veritable gold mine for its possessor. In one instance an intelligent working of the placer made it pan out upward of four hundred dollars.

As no specific has been found to correct the phosphoric taint, medical and dental science of the present day direct their attention rather toward prophylaxis than to remedial treatment. If the cause be removed the effect will disappear.

Already, chemists have shown us how the inoffensive red, or amorphous, phosphorus can be substituted for the dangerous metalloid hitherto employed, and American inventors have proved the practicability of manipulation by machinery in closed compartments, where the fumes offer no inconvenience to the operatives; so that we can safely predict that, in the early future, "phossy jaw" will be known only to those who delight in musty lore and in comparing old-school teachings with the self-sufficient theories of their own day.

**La Presse méd.*, May 1899.

GOLD INLAY BRIDGE WORK.

By ERNST J. EISEN, D.D.S., Milwaukee, Wis.

WHILE inlay bridge work has nothing about it which would stamp it as new, still certain points in its construction might present it in a more favorable light.

By following pretty closely the lines laid down in cavity preparation as practiced to-day, this method in certain cases

is not only attractive but fairly indicated over others.

Where the second bicuspid or first molar is missing in either upper or lower denture, provided the first bicuspid and molar are in good condition; in the presence of facing approximal cavities; or where teeth are affected by pyorrhea with

gradually receding surrounding tissue—these conditions present most satisfactory phases; the first for esthetic reasons, the latter because of its advantages in a prophylactic sense, for it makes possible the continual visual control of the condition of tooth and gums.

The generally accepted rules for cavity preparation, *i.e.* angular cavities and extension to or beyond the "brush line," should be the guiding principle of all gold inlays for bridge work.

The walls should be absolutely parallel, the base flat, and the fissure extension flat with a greatly enlarged dovetail the shape of a T at the distal end.

its original proportions will give added strength and will avert any fracture of tooth-structure at this point. And not only this, but if it be made a practice to reduce the anterior buccal cusps in molars where an inlay is indicated, one will find that besides adding strength the reduction will aid in removing the matrix from the cavity, and make all cases comparatively easy to handle.

The burnishing of the platinum matrix should proceed as for any porcelain or gold inlay with the exception of its repeated removal and re-annealing, and prior to the last insertion the cavity should be thoroughly swabbed out with vaselin. Sticky-wax should now, with

FIG. 1.

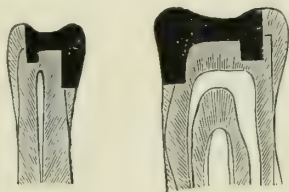
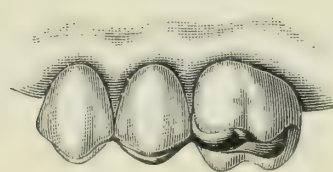


FIG. 2.



FIG. 3.



Provided all the walls are parallel and the base of the cavity is flat, platinum foil may be burnished into place and removed with as much ease as though the cavity were rounded and shallow. Great care must be taken to give the cavity sufficient depth in order to get the greatest strength and solidity. It has been my practice to sink a dovetail or T about one-sixteenth of an inch lower than the fissure which is at right angles to it. This adds greatly to the strength of the inlay and places the strain at the most favorable point.

In preparing a cavity for a gold inlay, be it for a filling or as an abutment for a bridge, it is well to consider that the portion of tooth most liable to fracture through strain, or direct force, is the partially obliterated cusp. The reduction of the anterior buccal cusps in molars and the building of the inlay to

matrix in place, be forced into the cavity with as little surplus as possible. Any surplus should be removed with a warm instrument and the approximal portion given the shape desired for the inlay. The entire impression should now be removed and invested so that all but the masticating surface is surrounded; this is left open so as to be visible from above. When the impression has hardened the wax should be boiled out and the entire investment brought up to a high degree of heat. Molten gold, 20 to 22 k., may now be run into the matrix. Made in this way an inlay will require but little trimming, and as a rule will fit more perfectly than when one piece of gold after another is flowed in.

The completed inlay should now be placed in position and an impression in plaster taken. Some difficulty may be met with in determining the exact posi-

tion of the inlay in the impression unless it is marked in some way. A cross (X) may be filed on the surface, but I have found it much more satisfactory to place several little spurs of wax on the inlay in such a position as to allow the plaster to be withdrawn without disturbing either inlay or "markers."

Prior to investing for soldering it

might be well to paint the under side of the inlay with a solution of precipitated chalk, thus averting any possibility of solder running in.

A well-fitted inlay bridge in desirable cases is a gratifying piece of work, and when once mastered is by far the most satisfactory and interesting to patient and operator.

A METHOD OF SWAGING ALUMINUM BETWEEN PLASTER DIES IN VULCANIZER FLASK.

By Dr. STEWART J. SPENCE, Chattanooga, Tenn.

FOR the past month or two the writer has been experimenting very satisfactorily with a method of swaging aluminum which he believes has some advantages over the usual method of swaging between zinc and lead. It consists in bringing the plate to shape between a die and counter-die of plaster, poured respectively into the upper and lower sections of a common vulcanizing flask.

The reader may possibly remember that in the issue of the *Cosmos* for July of the present year in an article entitled "The Behavior of Plaster of Paris," the present writer mentioned a method of swaging aluminum between a hard-setting plaster and shot in the Parker swaging device. It was there stated that though this could be successfully done the process was open to the objection that the heavy blows necessary to drive the shot would crack the die vertically. I make this digression to remark that later experiments showed that this objection could be overcome by making the base of the die perfectly flat—by placing it while crystallizing upon a piece of plate glass—so that, resting on the flat floor of the swaging device, it is so supported at all parts of its base as to be unlikely to crack vertically. There yet remains, however, the objection that very heavy hammering, and the use of the

pliers toward the last, are needed to swage the plate to the die along buccal and labial surfaces where anything of a depression exists, because shot will not flow around and press with sufficient force upon these surfaces. While thus experimenting, the following more simple and effective method was generated in the writer's mind—largely through the able suggestions of his next-door neighbor, Dr. S. B. Cook.

The lower section of a vulcanite flask (one without separable bottom, and small in proportion to the upper section) was filled with Spence's plaster, and at the same time plaster from the same mix was poured into the impression and then inverted and pressed down on the plaster in the flask, so that the two became united to form a die, or model. Care was taken that the impression was not pressed down below the edge of the flask, as this would have resulted in an elevation of the corresponding portion of the counter-die above the edge of its section of flask, and thus of its being left unsupported by the flask wall at a point where such support is specially needed in swaging, to prevent its flaking off under the pressure.

When setting had occurred and the tray and impression had been removed, the next operation consisted in providing for a space between die and counter-die

along the buccal and labial surfaces, to make room here for the plate. (This provision is unnecessary in swaging with metal dies, because it is made during the swaging by the compression of the lead counter-die. This, however, is more true with the thin and comparatively hard 18-k. gold plate than with aluminum, which being softer and thicker is to some extent stretched and squeezed out between the two metal dies, this constituting an objection to their use.)

This required space was obtained by fitting a strip of base-plate wax, about six inches long and a half inch wide, to the entire labial and buccal surface. It is not essential that this wax be exactly the same thickness as the plate, because, if the space made by it between the dies be a little smaller than the plate, the counter-die, being of a softer plaster, will yield sufficiently; and if it be a little larger, that is easily remedied by inserting in the resulting space a strip of rubber, in the way hereafter described. With this strip of wax *in situ*, its upper edge, that is, the one nearer the ridge, is brought to a bevel by a hot spatula being drawn over it; the melted wax flowing to the median line of the ridge. No wax is used on the palatal surface. If an air-chamber be desired it is now provided for by affixing to this surface a piece of aluminum plate.

The die thus prepared is dressed with soapstone and the counter-die is made by filling the upper section of the flask with Spence's plaster, so mixed as to set somewhat softer than the die. This plaster can be worked to set with from one to eight times the hardness of plaster of Paris, and in these swagings the die was given a hardness of about eightfold, and the counter-die about fourfold, that of that material.* After crystallization, the flask is opened, the wax removed, and swaging is performed by screwing together the sections of the flask.

*An easy and exact method of finding the relative compressibility of any two plasters, or plaster and metal, is this: Into the two sections of a vulcanizing flask pour respectively the two materials to be tested, then

As aluminum is more pliable than the 18-k. gold used in gold plate work, it can be very nearly conformed to the dies by pliers, etc., before flask-closure begins. For the same reason the horn mallet is not needed; a piece of wood, such as the handle of a vulcanite scraper, applied by pressure, answers the purpose better. This softness of aluminum, however, allows of its being easily marked by the pliers, which therefore should be muffled; that is, a soft substance, such as tin, is wrapped around one of the beaks—that one which is used on the inner side of the plate.

The plate having thus been brought by pliers, shears, etc., to sufficient adaptation to the dies to allow of the bolts and nuts of the flask reaching each other, pressure is applied and the flask is partly closed. It is then opened, and the edge of the plate where too redundant is trimmed down and then the pressure is reapplied. Of course the plate should be occasionally annealed, and the dentist should be aware that aluminum blisters before assuming redness. On nearing the close of the swaging some force is necessary to turn the nuts, and it is not wise to hold them too near the eye when thus under heavy strain.

As in the early swaging there is much pressure made on the margin of the counter-die, usually some compression of this margin results, so that after closure the operator may detect space between the edge of plate and counter-die where the latter has thus been compressed. Of course, at such points the plate has not been driven against the die. To remedy this, and to bring the entire labial and buccal surfaces of the plate thoroughly up against the die, a strip of pink rubber, similar to the before-mentioned strip of wax, should be placed between the plate and counter-die along the buccal and labial surfaces and the flask reclosed.

In some of my early swagings I was

place between them some substance which has each side equally capacitated for penetrating, such as a steel ball, and screw down. Fill the depressions thus made with wax, which then roll into ropes of equal thickness. Their relative lengths will give the answer.

annoyed by an occasional slabbing off of small flakes from a protruding ridge. The cause of this breakage soon appeared: Where there is any overhanging of a protruding ridge, even though the accompanying depression be filled flush by the before-mentioned strip of wax, there will be insufficient space for this protruding ridge to pass the margin of the counter-die. They may even come in contact, with the result that one or other will be chipped. The case is aggravated when a plate goes between them. Prevention of this lies, first, in tilting upward the protruding ridge so that it will not overhang, and second, in adding to the strip of wax enough melted wax to cause all labial and buccal surfaces to assume a distinct outward slope downward from the ridge. In the final swaging the use of one or two pieces of pink rubber applied at the spaces which will result from this waxing will readily force the plate to the die at these points.

The writer has swaged two plates on one die, the first one being No. 16 gauge and the latter No. 18, without any perceptible compression of the die or any breakage; and when it is remembered that No. 19 is thick enough for plates, the certainty of this method is proved.

A plate swaged by this mode has none of the spring which frequently accompanies one swaged by malleting, but sits perfectly dead upon the die. This is because the blow of a hammer tends to curl a piece of sheet metal, while the slow steady pressure of the screw, for some reason, does not so do.

While the above method works successfully, yet the writer has tried a modification of it which may be briefly mentioned. It is this: Instead of applying only one thickness of base-plate wax to

only the labial and buccal surfaces, he has used two thicknesses and covered the entire model. This results in a large space between the dies, into which the plate can be easily, though at first imperfectly, swaged. After this preliminary swaging, a sheet of red rubber, with an extra strip along the buccal and labial surfaces, is placed in the counter-die, and the case re-swaged. This imprisoned rubber becomes temporarily very hard under the pressure, and so performs fairly well the part of a counter-die. But a very much greater pressure is required by this method than by the other to bring out the rugæ and suction chamber. Indeed, all the force I could apply with a flask press and the three bolts and nuts quite failed to give anything like a sharp margin to the chamber. However, a mere relief chamber can readily be obtained by this latter process, and this is to be preferred to an air-chamber when a plate has been swaged under conditions so favorable to adaptation as those here indicated—on a die absolutely without either expansion or contraction, taken direct from the impression, and not on a die composed of a contracting metal (zinc) taken from a sand mold made by an expanded plaster-of-Paris model derived from an expanded plaster-of-Paris impression.

The possibilities of flask swaging are not limited to aluminum. Doubtless platinum, and perhaps partial gold plates, could be similarly swaged successfully. Nor is the method limited to plaster for dies and counter-dies; Melotte's metal, tin, porcelain, etc., can be used in this connection. The writer has swaged gold dummy shells, both singly and in blocks, using porcelain teeth for the dies.

A CONTRIBUTION TO THE CHEMISTRY OF DENTAL CEMENTS.

By Dr. ALBIN LENHARDTSON, Stockholm.

(Read before the Section on Odontology and Stomatology, Fourteenth International Congress of Medicine, Madrid, April 23, 1903.)

CONSIDERING the unceasing development that has taken place during the latest decades in our department, it greatly surprises me that the cements which we employ have been subjected to no thorough scientific investigation worthy of mention.

Our cements in many respects possess valuable qualities as filling material. The essential drawbacks are that they do not withstand either acid or alkaline reaction or attrition. Another of their defects—to which of late our attention has been drawn, and not without good cause—is their penetrability to fluids. With regard to the question of their expansion and contraction, it is as yet theoretically too far from a complete solution for any definite opinion to be advanced.

It is occasionally found that a cement, on being mixed, develops a more or less appreciable heat at the moment it stiffens, and that, on the sudden reaction, an expansion, with consequent contraction, may arise, is highly probable; but this is a defect that most manufacturers have overcome. The power of the cement to resist the penetration of acids is in direct connection with the degree of intimacy obtaining between the oxid and the acid.

What are the chief qualities necessary for a cement of rational composition? It should—

- (1) Withstand both the acid and alkaline reaction of the mouth.
- (2) Neither expand nor contract.
- (3) Be impervious to fluids.
- (4) Withstand attrition.

(5) Neither attack the substance of the tooth nor exercise any irritating influence on the pulp tissues.

(6) Be in color similar to the tooth.

On criticizing our cements from the above points of view we find that unfortunately they all sin against (1), (3), (4), and some against (2), though this should cause us no surprise when we remember their chemical composition.

The oxid of them all is, as we well know, zinc oxid. On glancing at Mendelejeff's table of the chemical elements, we find zinc oxid in the second vertical column, which in other words is a sign that it is a very strong positive oxid. As a fact, however, all the combinations between strongly positive elements and phosphoric acid are generally easily soluble in other acids, as lactic, butyric, and other similar acids. On the other hand, the weaker the bases are, the greater propensity do they exhibit to enter into insoluble union with weaker acids. But a factor of perhaps still greater importance is that the combination entered upon by the oxid with the lactic acid—lactate—is itself soluble. The consequence naturally is, that as the zinc lactate forms in the filling, it is washed away again and again by the saliva. If, on the other hand, the oxid entered into an insoluble union with the lactic acid, the danger would be less. A third grave objection to zinc phosphates is that they are easily dissolved in alkalis.

Most manufacturers add various substances—for instance, manganese super-

oxid, thallite, clay, silicic acid, etc.—in the powder, probably with the idea that some double salts of great resisting power will ensue. Thus Fenchel, for instance, avers that the silicic acid in the powder in course of time forms a silicate. My own opinion is that this is very unlikely. Another interesting question is whether the oxid should be vitrified or not. Stark, who has carried on many experiments with zinc phosphates, deems that vitrifying is of the greatest importance. Ames, on the contrary, considers that the crystalline zinc oxid gives a better result than the vitrified amorphous oxid. By vitrification, however, the oxid becomes of considerably greater specific gravity, so that it is heavier and renders the entire filling more homogeneous.

The question now ensues: If zinc oxid be unsuitable, where can a better oxid be found? As I have before stated, it is to be sought among those elements, which—according to Mendelejeff's scale—are more closely connected with the negative elements. Of late years I have experimented with very many of the oxids of these elements, as monacite and exonite earths, and oxids of calcium, aluminum, beryllium, zircon, cerium, thorium, etc. My investigations are not as yet fully completed, but still I have found that several of these oxids enter into very close relationship with phosphoric acid, being soluble neither in an acid nor an alkaline solution. Their fracture surface is at times similar to enamel, and hard. Contrary to zinc oxid, several of them form insoluble lactates.

When studying these phosphates certain theoretical queries are of great interest. Thus the ion theory, put forth by Arrhenius, a Swede, will doubtless play no unimportant rôle as regards the solution of these questions. The characteristics of acids, according to the generally accepted ion theory, depend on their ions of hydrogen, those of the bases on their hydroxyl ions. For the thorough investigation of this subject, among other things it is necessary that the coefficient of dissociation for acids and bases be determined.

The fluid. As a solvent for the oxid

there can be no question of other acids than those which, in combination with the oxid, give salts insoluble in water. The stronger acids, as sulfuric, nitric, chloric, and hydrobromic acids, cannot therefore be employed. Chlorin, for instance, according to Mendelejeff's scheme of the elements, is a strong negative, for which reason its salts are, as a rule, easily soluble. This our practice proves to be true, as the chlor-zinc cements offer little power of resistance, which is explicable by the fact that the basic chlorids are more easily soluble in acids than corresponding phosphates. There then remain but two acids to choose between—hydrofluoric acid and phosphoric acid. With regard to the first, Telschow some years ago certainly made experiments therewith, and averred that he obtained very fine results; as, however, nothing more has been heard of the matter it is to be supposed that hydrofluoric acid proved unsuitable, which fact my own experiments therewith have confirmed. With respect to its being poisonous, later investigations have proved that it is not more so than hydrochloric acid. As, however, it is easily volatilized, very unpleasant results may occur, its gases being apt to irritate the mucous membrane.

Phosphoric acid. The elements of the nitrogen group—nitrogen, phosphorus, arsenic, vanadium, etc.—are all weak negative elements, which in combinations with oxygen form compounds the corresponding hydrates of which are strong acids. Of these, however, only the acids of phosphorus and arsenic are conceivable as soluble in water. Arsenical combinations are of course excluded, as being poisonous.

There are three different phosphoric acids—ortho-, pyro-, and metaphosphoric acid. Orthophosphoric acid, H_3PO_4 , is the only one of these suitable, as it yields the most enduring metal salts. It is a tribasic acid—that is to say, the three atoms of hydrogen therein allow of substitution of an equivalent amount of metal oxid. Of alkaline metals the most constant salts are those of weak acids. Orthophosphoric acid is of a specific

weight of 1.84 at 15° Celsius (59° Fahrenheit). It is of treacly consistence, stiffening by degrees, but very easily attracting moisture from the atmosphere and becoming diffuent.

Pyrophosphoric acid is quadrubasic. Up to the present date but two kinds of salt are known—those in which all four and those in which but two hydrogen atoms are replaced by metals. This acid forms a soft, opaque mass, slightly poisonous which easily dissolves in water.

Metaphosphoric acid is monobasic, and therefore forms only those kinds of salts that are insoluble in water. It coagulates albumin.

Both pyro- and metaphosphoric acid illapses in course of time to orthophosphoric acid by suction of water. As the last-mentioned acid, moreover, enters into the most intimate unions, there is no reason why anything but pure orthophosphoric acid should be used.

An objection against the acid last mentioned is that it is liable to enter into combinations while developing heat, and this is probably the reason why, as a general rule, manufacturers mix in pyro- and metaphosphoric acid, as these contribute to a slower reaction. By previously partly saturating the orthophosphoric acid with oxid, this drawback may be obviated in a far better manner. However, saturating it to such a degree that the phosphate therein cannot be kept diffuse, but falls out like a crystalline sediment, is in my opinion inadvisable, not only from a practical point of view—as, in order to obtain a homogeneous solution the whole quantity of liquid must be heated till every ingredient is dissolved; but also from a chemical point of view—as, during this heating, changes in the fluid are not precluded.

In conclusion, let me in a few words, call attention to a few apparatus specially suitable for the closer study of cements. Gustav Hedstrom, a dentist of Stockholm, who of late years has studied amalgams in a thoroughly scientific manner, has constructed three of these apparatus. The fourth is a common sensitive apparatus similar to those in use for determining the resistance under

pressure of Portland and similar cements.

In order to measure the change in volume of a substance, he has constructed a micrometric apparatus provided with a Norrins scale fixed to the movable object-plate of an ordinary microscope, which should enlarge five hundred times. In the ocular a so-called hair-cross is placed, and in this manner so slight a change of volume as 0.0025 mm., or 2.5 microns, can be read.

For examinations regarding the relative durability of substances there have been constructed two other apparatus. One is a packing matrix in which a substance to be examined is packed in comparatively long rods under pressure. These rods, which are of exactly the same length and diameter, are then placed in another apparatus. This consists of a stand for placing the rods in a horizontal position. At a certain distance from the point of support a bowl is hung up, into which mercury runs from a reservoir until the rod breaks under the strain, when the access of mercury is instantaneously cut off by an automatic closing contrivance. The cup or bowl of mercury is weighed and the relative durability is thus ascertained.

In order to investigate the porosity of cements the proposal has been made that they should be laid in anilin fluid, and after a more or less lengthened period of time the cement fillings should be broken up, when ocular demonstration will prove how far toward the center the fluid has penetrated.

This method of examination certainly possesses the advantage of being remarkably simple, but it can scarcely be called a scientific one. For this purpose there has been constructed an apparatus of great nicety, produced by the transformation of a highly sensitive analysis balance to a hydrostatic one. The one scale is removed, and in its place the cement filling (tied by a hair) is hung. Under the cement filling—the absolute weight of which has been previously ascertained—a bowl of distilled water is placed; thus the specific weight in water is obtained. Afterward the precise amount

of water that each sample of cement absorbs can be read to a certainty.

For the examination of the resistance of cements to pressure, Bebee has constructed a special apparatus; but apparatus designed for the examination of ordinary cements I consider preferable.

In this paper I have simply endeavored to hint at a few methods which might in some degree contribute to the solution of the question—for the benefit especially of any who may be inclined to devote time to the certainly difficult but most interesting study of cements.

CORRESPONDENCE.

PULP-MUMMIFICATION.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—After reading the editorial on pulp-mummification and the “possible dangers attending the same,” in the October 1903 issue of the DENTAL COSMOS, I feel it my duty as one who practices that mode of treatment perhaps as often as any other practitioner in this country, to say a few words in defense of said treatment. I have in the past seven and a half years mummified over two hundred cases, and it is no more than fair to my professional brethren to say that I have not met with one single case such as described in your editorial.

Whether the failures of which you speak are due to the causes mentioned in the editorial (*i.e.* the formaldehyd solution forty per cent., or to too much arsenic) I am not in a position to say,

but that the failures are certainly due to some carelessness in treatment or manipulation is very evident. Because there are as you state some failures from some unknown cause, I think it is unfair to condemn the treatment in general. I stated in my paper read in July 1898, at the meeting of the New Jersey State Dental Society at Asbury Park, that I thought the treatment was “all right,” and up to this time I have seen no reason to doubt the correctness of that statement; and in justice not only to myself, but to perhaps hundreds of other dentists who are using the treatment successfully, I would ask you to publish these few lines in the next issue of the DENTAL COSMOS.

J. A. WAAS.

HAMMONTON, N. J., Oct. 5, 1903.

FORMALDEHYD IN TREATMENT OF ROOT-CANALS.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In the DENTAL COSMOS for September, at page 751, I notice your review of my paper entitled “Formaldehyd in the Treatment of Root-Canals,” and I wish to thank you for calling attention to what might be the cause of some serious trouble due to the fact that I failed to make myself plain.

I should have stated that I merely wiped out the canal with a forty per cent.

solution of formaldehyd instead of saying that I applied such a solution and then sealed for twenty-four or forty-eight hours. My practice is to wipe out the canal with this solution, then dry it and apply a dressing of campho-phénique for twenty-four or forty-eight hours, after which the canal is filled unless the septic trouble still exists.

B. F. THIELEN.

PARIS, TEX., September 20, 1903.

PROCEEDINGS OF SOCIETIES.

FOURTEENTH INTERNATIONAL CONGRESS OF MEDICINE, MADRID, APRIL 23 TO 30, 1903.

Section XII: Odontology and Stomatology.

Committee of Organization: President—Dr. Guedea. Vice-presidents—Drs. Sanchez and Heddy. Secretary-general—Dr. Florestan Aguilar. Adjunct secretary—Dr. L. Subirana. Members—Drs. Salcedo, Lopez Alonzo, Carol, Plet, J. Alonzo, Casasnovas, Cladera, Ferrer, and Baca.

Honorary Presidents of the Fourteenth International Congress of Medicine appointed from Section XII: Professors W. D. Miller, Berlin; Truman W. Brophy, Chicago; Ch.

Godon, Paris; Edward C. Kirk, Philadelphia.

Honorary Presidents of Section XII: Drs. Harlan, Chicago; McFarland, Frankfurt; Jenkins, Dresden; Cryer, Philadelphia; Sauvez, Paris; Chompret, Paris; Harding, Shrewsbury; Amoëdo, Paris; Giuria, Genoa; Bryan, Basle.

Honorary Secretaries of Section XII: Drs. Mitchell, London; Förberg, Stockholm; Martinier, Paris; Robinson, Bordeaux; Papot, Paris.

FRIDAY, APRIL 24TH—Afternoon Session.

THE meeting was called to order, and the president, Professor GUEDEA (speaking in Spanish), delivered the following address:

PRESIDENT'S ADDRESS.

Gentlemen,—To the foreign members of this section I desire to express my heartfelt regret for the necessity under which I labor of expressing my thoughts in a language which perhaps is not familiar to all present. Although I deeply regret this fact, were I to speak in any language but my own I could probably never succeed in conveying to you the sentiments that inspire me in delivering to you this address of welcome.

In presiding over the work of this section—an honor which I fully appreciate and which I have attained through circumstances which were the result of good

luck rather than by any personal merit—my first duty is to welcome the members of this section—both ladies and gentlemen—who have so willingly responded to the call of the Spanish committee, leaving their homes and their work in order to attend this great international gathering which it is to be hoped will have an important influence toward raising our present status of living, and toward the preservation of human health.

The part that this section will take in the general work of the congress will, I believe, demonstrate the value and importance of its contributions, and in this respect I am sure will not be surpassed by any of the other sections comprising this international meeting. I make this statement with the utmost confidence, judging from the nature, the scientific character, and the number of contributions submitted, and also because the continuously progressive and worldwide

evolution of odontology constitutes it no longer a modest profession, but perhaps the most prosperous, farthest advanced, and most progressive specialty among those within the realm of medical science.

It pleases me beyond measure that this should be your status, and although unable personally to attend your deliberations, I shall follow with keen interest the work of your section.

It is further very gratifying to me that this gathering occurs at a time when dental education in Spain has undergone a radical reform such as marks for odontology a degree of progress the advantages of which will accrue to Spain and cannot be looked upon with indifference by the other nations.

The reorganization of dental education, carried into effect by the efforts of some whose modesty I will not affront by giving their names, is of transcendent importance to odontology. I am sure that the foreign members will approve our organization when they are given the opportunity to visit the dental clinics, and to observe the facilities for practical demonstration in the Faculty of Medicine. We will show them that in this respect our modest country has not remained very far behind those in which odontology is most advanced.

It is a source of great satisfaction to me that this section is honored by such a large attendance. The number of members who have been registered is beyond four hundred, one hundred and fifty more than at the last Congress of Medicine in Paris. The communications number one hundred and fifty, and the clinical demonstrations twenty.

As all scientific branches, even the moral and political ones, are gradually acquiring an intensely practical character, it seems unnecessary to bring out this point in connection with odontology. I must, however, remind you of the part you ought to take in solving those problems on the hygiene and alimentation of the working-man, bodily accidents, children's asylums, milk supply, and several other problems of eminently practical character.

I do not desire to detain you any

longer, but must add that the honor of presiding over your opening session is the greatest that could ever be conferred on me.

Before closing I want to mention the magnitude of the work accomplished by the Committee of Organization—by all its members save myself—a work which may serve as an example to all of the other sections.

I will now close—not, however, without greeting the odontological press—the press, that manifestation of human activity which carries our thoughts everywhere, producing such wonderful results as are evinced in this congress.

SECRETARY'S REPORT.

The secretary-general, Dr. FLORESTAN AGUILAR, read his report, as follows:

Gentlemen,—It is my duty as secretary-general of this section to give you an account of the work that we have done in the organization of this meeting. I need not add any words of welcome to those so eloquently expressed by our worthy president, who, in the Castilian tongue, has told you how pleased and how proud we are to receive within the boundaries of our soil such a distinguished representation of eminent *confrères*, who, inspired by the highest altruism, and imposing upon themselves the trouble, expense, and annoyance of long journeys, have come here to work for the advancement of our profession. We Spanish dentists hope that at the close of this meeting you will find your efforts requited by the satisfaction felt after the accomplishment of a duty, and by the pleasure of having demonstrated to the medical world the importance of dentistry, which for the first time, in Europe at least, will prove that by the development it has made, by the contributions that it has given to the advancement of science, by the quantity and quality of the work that its members are doing in this enormous scientific beehive, it not only merits to be considered as one of the important branches of the healing art, but that by its growth, by having completed its evolution, it has acquired sufficient personality to be

emancipated from its mother, Medicine; that is, without losing its links of relationship with the rest of the sciences devoted to relieving suffering humanity, to constitute the first medical specialty sufficiently well defined to become by itself an independent profession.

Let us look backward at the origin of scientific dentistry, in a retrospective analysis of the times of Morton and Harris, and of the foundation of the first dental society, presided over by Harris—whose name should be written with golden letters in the annals of dentistry. Anxious to elevate to the rank of a profession what then constituted more or less a trade, these men applied to the authorities of some medical institutions in America, modestly begging that the principles involved in the art of treating the teeth should be taught by a chair of the schools of medicine. But their pretension was considered ridiculous; their words were not heeded. The medical profession could not condescend to have any relation with what they considered more or less the exclusive patrimony of charlatans and conjurors.

How times have changed since then! The *bona fide* enthusiasm of Harris and his followers was not conquered, but, giving evidences of that geniality peculiar to the American character, they had to do a thing and they did it, founding in 1839 the first college where dentistry was to be taught as a profession.

The evolution of odontology in a period not exceeding sixty-five years has been great. Through the persistency of its members, who without once wavering profited by every occasion in every way to work unselfishly for the general good, it commenced to make itself heard, and continued creating a public opinion that had not before existed, and is finally now establishing itself in its rightful place, because everything that is just, everything that is noble, that is right, must triumph and prevail in every country and everywhere, even if it have to fight down routine and tradition, those powerful enemies of all that is new and progressive.

Twenty years ago in Europe the den-

tist had not in the fraternal circles of the medical practitioners the social consideration due to the professional man, while to-day, gentlemen, I can scarcely contain my pride in announcing that of all the twenty-four sections into which this congress is divided, this one of Odontology contains the largest number of members; that the 460 members assembled here constitute the largest body of dentists who ever worked in fraternal union with their other *confrères* at a medical congress; that of all the groups into which this meeting is divided, the section of Odontology has in its one hundred and fifty-two papers presented more for analysis than any other section; and that, for the first time in the history of our profession, members chosen from it have been elected to receive that honor which can be considered the highest distinction bestowed upon a worker of the medical sciences and exclusively reserved for those who arrive at the category of savants, of being appointed president—not of a group of odontologists, but of the International Medical Congress. Amongst the persons elected to preside at this Fourteenth International Medical Congress—constituted of 7200 members at the opening meeting yesterday—some names were included which are dear to and honored by all of us: Professors Miller, Godon, Brophy, and Kirk were appointed presidents of the Congress. In tendering them my highest congratulations I joyfully felicitate the dental profession that they adorn.

Before concluding, gentlemen, I must express in the name of the organizers of this meeting, and in the name of the Spanish profession, our sincere apologies for the numerous defects and trying inconveniences in the organization of this section. This congress is in danger of being damaged by its own success; you heard in the address of the secretary-general yesterday some figures which proved my assertion. In Madrid, a comparatively small capital where there do not exist sufficient hotels or buildings or accommodations for such a large gathering, 7200 men have assembled to discuss

the problems of medicine, and this unexpected number of visitors has resulted in a general overwhelming for which, unfortunately, no remedy can be readily improvised.

Yes—in spite of our enthusiasm, in spite of our earnest and sincere desire of being as courteous and as hospitable as your presence merits and as the immemorial Spanish chivalry demands, you will find defects which our forces cannot avoid, and for these I pray your indulgence; please be kind enough to overlook them, and to believe that in tendering you our heartiest greeting we wish you to know that, without reserve, we place at your disposal everything we have, and that in heart and soul Spain is honored and glad to have you here. Permit me to use an English phrase, as it is eloquent and expressive, and to say to you in the name of Spanish dentists: Gentlemen, you are welcome!

The President announced that the next number in the order of business would be the election of officers.

Dr. LOPEZ ALONZO made a motion to the effect that the officers of the Committee of Organization be elected to fill the same offices respectively in the Section of Stomatology—viz, president, vice-president, secretary-general, adjunct secretary, and members of committee.

This motion was duly seconded and unanimously approved.

Dr. AGUILAR. At the opening of the Congress yesterday the following were elected honorary presidents of the Fourteenth International Congress of Medicine from this Section: Professors Miller, Berlin; Brophy, Chicago; Godon, Paris; and Kirk, Philadelphia. The Committee of Organization nominates for honorary presidents of this section Drs. Harlan, Chicago; McFarland, Frankfurt; Jenkins, Dresden; Cryer, Philadelphia; Sauvez, Paris; Chompret, Paris; Harding, Shrewsbury; Amoëdo, Paris; Giuria, Genoa; and for honorary secretaries Drs. Mitchell, London; Förberg, Stockholm; Martinier, Paris; Bryan, Basle; Robinson, Bordeaux; and Papot, Paris.

These nominations were unanimously approved by the section.

Dr. A. W. HARLAN was called upon to occupy the presidential chair, and addressed the meeting as follows: It was a great surprise to me to be called upon to preside over the first session of the Section on Stomatology and Odontology of the Fourteenth International Congress of Medicine. I hope that your deliberations this morning will be conducted in a manner satisfactory to everyone present. The authors of papers are allowed fifteen minutes in which to present them, and those who desire to discuss them will have five minutes.

(To be continued.)

MARYLAND STATE DENTAL ASSOCIATION AND THE DISTRICT OF COLUMBIA DENTAL SOCIETY.

Annual Union Meeting.

THE annual union meeting of the Maryland State Dental Association and the District of Columbia Dental Society was held in the amphitheater of the Dental Department of the University of Maryland, Baltimore, Md., May 21, 22, and 23, 1903.

The first session was called to order at 10 o'clock Thursday morning, May 21, by Dr. E. E. Cruzen, chairman of the joint committee of arrangements.

Rev. S. M. Alford, Baltimore, offered the opening prayer.

Dr. H. A. Wilson, president of the

Maryland State Dental Association, then made an address of welcome, which was responded to by Dr. L. F. Davis, president of the District of Columbia Dental Society.

Dr. Davis was called upon to take the chair and preside at the meeting.

Dr. S. W. BOWLES, Washington, D. C., then read the following paper:

SANITARY BRIDGE WORK.

I have chosen this subject because it has been very hard in practice for me to make what I consider absolutely sanitary bridge work, and on examining the work of others I have concluded that this problem presents itself to almost all practitioners of dentistry.

The first step forward in perfecting a condition of cleanliness in bridge work is to make a perfect adaptation of the abutment pieces to the teeth selected for the foundations. This depends, in my mind, entirely upon the proper preparation of the roots of the teeth to be crowned, because, after the root is perfectly prepared, it is comparatively an easy thing to fit the band to it. The essential point in preparing the roots of teeth is that the circumference of the band be accurately adapted to the circumference of the teeth where the band is to rest, and this if possible should lie just under the free margin of the gum. In all cases the root of the tooth should be formed so that its sides will be parallel or slightly convergent from the gum margin to the occluding surface; and usually this condition is obtained when all the enamel is stripped off. In other words, the root of the tooth will be in the shape of a truncated cone. With a dentimeter it is possible to secure this absolute measure, and an absolutely perfect-fitting band can be placed upon a root prepared in this manner. That is the first step toward clean bridge work. There is no chance for the lodgment of food débris and secretions on the tooth. The gum will be kept in the same condition as before, because the band will take the place of the enamel which has been cleaved off. The condition will be practically the same as in nature.

Another source of unclean bridge work is ill-fitting open-faced jackets. I think that these are perhaps the greatest sources of trouble. To make a perfect-fitting open-faced jacket the tooth must be prepared as described, which often spoils the esthetic effect of the piece, so that, unless it can be fitted perfectly, I think we are not justified in making open-faced jackets of any kind. As a substitute I think it is the most conservative practice to devitalize the nerve, and choose some form that can be kept clean—for instance, a Richmond crown with a band. Another method would be to put a strong pin into the canal from the lingual surface where it can be left open enough to be washed and kept clean.

Another source of unclean conditions is the misuse of the porcelain facing. If possible, a detachable or removable facing should always be used. There are several good ones on the market, and a number of methods for making detachable porcelain facings, which are sealed on with some insoluble cementing medium that makes a connection between the gold and the facing, giving an absolutely clean condition. The Mason detachable facing I have used in many cases and have found it satisfactory. Dr. E. A. Bryant's method is very commendable and gives the desired result. If, however, it be not possible to use the detachable porcelain facing, the ordinary facing should be shaped so that the backings can be burnished perfectly to it, making a perfect joint. It should be beveled toward the gum margin and toward the cutting edge, and reinforced with solder. However, the gold should not be visible from the front of the mouth. In the posterior part of the mouth, posterior to the first or second bicuspid, it is good practice not to use porcelain facings, but to use the system known as open bridge work; that is, simply swaged cusps on the occluding surfaces, supported by a platinum bar connecting the abutments, leaving the under surface to be cleansed. With the short bite it is particularly advantageous because it leaves a space easily cleaned between the gum and the prosthetic piece. I have a model

of a piece here that I made not long ago that shows the use of the Mason facing, and also a piece of connected bridge work that is best in the posterior part of the mouth. The porcelain facing should be ground so that there is only one point of contact between the tissue and the shoulder of the porcelain, placed so that a quill toothpick or silk can be passed between them and the condition made thoroughly clean. In this case I have striven to do that, and while the model will not look as though I have achieved the result, because of extraction, I anticipate that when the absorption has all taken place the spaces will be V-shaped and open so that it can be easily cleansed.

Another great source of uncleanness is what are known as saddle bridges. Permanent saddles placed in the mouth by the most skilful operator tend to an unclean condition no matter how perfectly fitted to the soft tissues. There is a space between the piece and the tissue where solutions are held, and it is practically impossible to keep them clean. I have never removed a saddle without finding a high state of congestion underneath, and this state of extreme congestion is not sanitary in itself.

The ideal bridge, of course, is that of porcelain, and if the same rules are observed this can be made very clean and sanitary. The only objection I think of is that the facings are not removable. I have not seen any system in the making of this kind of work which I thought was a good one.

These are the main points that I have been able to get together, and I hope you will not think by what I have said that I am in any way connected with the board of health. I chose this subject because it seems that we should put in bridge work that can be cleaned as well as the normal set of teeth. I have taken the time this morning to make more of a plea for sanitary bridge work than to advance any new ideas. The model which I passed around shows a system which I have adopted in many cases, and after they have been in place for two years or more I have found the mouth in a thor-

oughly clean condition. The under surfaces are polished very highly so as to be easily cleaned.

Discussion.

Dr. FREDERICK PRIMROSE, Baltimore. I must say that I cannot agree with the essayist on this subject. I am not in the habit of constructing bridges as the essayist has advised us to construct them, as I have never found them satisfactory. I do think that open spaces in bridge work are the filthiest things that can be put in the mouth. I have never seen a patient that would keep such a space clean. I have one now that I am going to take out and replace by a saddle. I find in the removable bridge, when the flange fits tight on the gum tissues without creating pressure, that on removal the flange is the only clean part of the bridge. This base should be of highly polished platinum, and on removal you will find it absolutely clean. It is more comfortable in the mouth, and the food does not get under there. People of a nervous temperament keep picking at these spaces, as they annoy them very much. In extensive bridges I find that where you can place a saddle or place the bridge down tight on the gum it is most agreeable to the patient and to the tissues, and also I find that the cleanest condition can be brought about.

Dr. J. GRIEVES, Baltimore. I want to congratulate Dr. Bowles upon his talk. I think that the subject is timely, and particularly well taken is the point he has raised with regard to the lingual spaces and the fitting of the bands at the gum margin. I do not agree with him, however, with regard to his method of preparing roots. If we strip all the enamel off of a root we destroy the contour which nature put there, and if you do not restore that contour you invite recession of the gum and create spaces in which hard pieces of food will inevitably accumulate. I must say that I do not agree with Dr. Bowles in regard to the spaces under bridges. I will tell you of a little experiment made of the two classes of bridges in the same mouth. One bridge was with the open spaces,

made like the bridge on the model which the essayist passed around; on the other side of the same mouth was put a contact saddle bridge; those two bridges were made by the same man with an equal amount of skill and care. After a year's time they were removed. The patient is a member of this society, and I wish he were here to tell you himself his experience with the two bridges. He said it was impossible for him to keep the so-called self-cleansing spaces clean, and that when the bridges were removed the under surface of the saddle bridge was perfectly clean, and in much better condition than that of the so-called self-cleansing bridge. It has been my experience with regard to these different bridges that when you do not have the gum surface protected with overlying metal, invariably the effort in mastication will cause the bridge to rise, and it is constantly forming one or two contact points, consequently leaving no cleansing space.

Dr. BOWLES (closing the discussion). I want only to add a thought in regard to the saddles when used in cases after extraction. When the teeth are extracted, and these saddles are placed in, you all know there is a tendency in the soft and hard tissues to be taken away by resorption, and within a very short time a perfect-fitting saddle becomes *not* a perfect-fitting one, and it soon becomes a source of irritation, with the lodgment of unclean material. Of course, where the absorption takes place slowly it does not bring about such a bad condition.

On motion the subject was passed, and Dr. HENRY F. R. SNYDER, Baltimore, read the following paper:

RESECTION OF THE INFRA-MAXILLARY NERVE IN THE TREATMENT OF A CASE OF FACIAL NEURALGIA.

This being my first opportunity of having the honor of addressing this distinguished body, I was rather astounded at my subject as it appears on the program. Permit me right here to disabuse your minds of the impression the title of my paper tends to convey, *i.e.* that I have performed this operation myself.

My talk will simply be a report on a case of facial neuralgia in which resection of the inferior maxillary nerve had to be resorted to before relief was obtained. I feel that a more comprehensive study of this disease should interest us dentists, as we meet with it frequently—more frequently, indeed, than would be generally supposed—and I believe we are in a more advantageous position to differentiate facial neuralgia from those pathological conditions with which it may be erroneously confounded than is the average general practitioner.

The clinical manifestations of neuralgia, when once seen, will make an impression upon our minds which is not apt to be forgotten, as during the characteristic paroxysms of this malady the patient passes through a series of most horrible tortures, which are calculated to arouse even the sympathies of those not overly sympathetic. The disease is described by one author in this way: "It is the cry of the starved nerves for blood." Though this definition is rather poetic it strikes me as quite correct, since the lack of blood in the nerves is synonymous with general debility, and general debility is undoubtedly a most frequent cause of neuralgia. Other causes which are important to consider are cold and traumatism. The different forms of neuralgia are well known. Anatomically considered we have cervical occipital, cervical brachial, brachial, intercostal and visceral neuralgia, sciatica or ischialgia, coccygodynia, and last, but not least, trigeminal neuralgia, also known as *tic douloureux* or *prosopalgia*, which not only is the most frequent variety, but which interests us especially, since it lies within the field of our specialty, it being supposed by some authors that disease toxins, as those of smallpox, typhoid fever, malaria, and syphilis, as also metallic poisons, are causative agents of neuralgia, and this disease is sometimes classified under these respective heads. Finally we come to the class of so-called reflex neuralgias, which we meet with in connection with uterine diseases and which occur in remote organs. To this class belongs the disease manifested in

the patient whom I will present before you at the clinic this afternoon.

We now return to *tic douloureux*. The term itself, meaning painful spasms, very aptly expresses the symptoms of this form of neuralgia. As said before, the spasms or paroxysms of pain symptomatic of this form of neuralgia are characteristically severe, and leave the patient in such dread of a recurrence that he frequently falls into a condition in which he readily becomes addicted to powerful narcotics, and quite often threatens and even sometimes becomes a victim of suicide.

Before going on to a discussion of the disease as it appears in this particular case which is before you, it is worth while to mention that odontalgia, as you well know, is frequently confounded with neuralgia by patients, and also by physicians who either do not deign or are incompetent to make a scrupulous examination of the oral cavity for dental lesions before pronouncing on a case of neuralgia. The case which I now desire to report is one in which the patient has been surgically treated in such a manner that it has resulted in cure, at least temporarily. I first met her in the clinic of the University of Maryland, where she came to have a tooth extracted. I examined her teeth and mouth carefully before proceeding to let any of the students take charge of the case. I found the teeth in good condition, and the tooth of which she complained had absolutely no signs of decay or other pathological condition. Having excluded the tooth, I proceeded to take her history, the most salient data of which were as follows: Neurotic family; previous onsets of the disease occurring during a period of twelve years, these attacks being of more or less frequent occurrence; uterine conditions abnormal; no history of malaria or other specific disorder. The pain which brought her to the clinic could be made out as quite localized along the course of the inferior maxillary branch of the fifth nerve. I decided that this nerve was involved and put her upon a treatment of chloral and potassium bromid. This prescription gave her but

a little temporary relief. I next had Dr. Stewart of the University Hospital treat her for some time with electricity. This treatment also failed. Under previous treatment at the hands of medical practitioners she had quite depleted the entire pharmacopeia, but no drugs seemed to be of any value whatever except perhaps iron and arsenic, which proved somewhat efficacious because, as in most cases of neuralgia, anemia was present. It may be added that the patient was fast falling into a condition in which she would become an habitual user of opiates. It is worth while mentioning that very rarely should morphin be employed in the treatment of cases of neuralgia to even give temporary relief, and never should the patient know what is being given when it is resorted to. Since medical treatment had absolutely failed, and the patient was rapidly losing ground, I concluded to suggest surgical interference.

I had almost forgotten to mention that a prominent physician had refused to operate upon the lady before I saw the case, and had put her on a treatment of quinin, believing that malaria was the causative agent producing her trouble. It need not be repeated that his treatment ignominiously failed. I do not believe such specific diseases as malaria, etc., to be the direct causative agents of neuralgia. In this opinion I am supported by Professor Osler of the Johns Hopkins medical school, who says that it has not been shown that neuralgia is any more frequent in malarial districts, and the error has probably arisen from regarding periodicity as the special manifestation of paludism.

Dr. Cushing, a noted specialist on neurectomy, also connected with the Johns Hopkins school, after going over the history of the case carefully and seeing her in a paroxysm, agreed with me that an operation should be resorted to. The first operation was performed in March of last year, and I had the pleasure of being present. The surgeon bared the nerve along the body of the inferior maxilla, and the nerve was cut and a small portion removed. This gave imme-

diate relief, but when healing took place symptoms of recurring pain at once manifested themselves. A second operation was consequently resorted to, and a considerably larger piece of the nerve removed. There was little inflammation after this operation, and the pain up to the present time has been completely relieved.

In closing I would remark that the gratitude of the patient at this—call it, if you will, only temporary relief—was striking; consequently, choosing between the two evils, the knife or insanity, the operation in this case was thoroughly justified.

Discussion.

Dr. R. G. RICHARDSON, Washington. I think Dr. Snyder mentioned the use of ethyl chlorid spray. I want to say that I have had good results from its use. I apply it on a small piece of cottonoid for two or three minutes at a time, and I find that it has a good effect. The patient will quiet down as nicely as could be expected. I also find that when patients complain of pain after extraction, or from a congested pulp, I can get good results and almost immediate relief by the use of ethyl chlorid. I would advise you to try it, as it works like magic.

A MEMBER. I would like to ask how long the effects last—if they are permanent, or only temporary?

Dr. RICHARDSON. The effect is not permanent; it is only temporary, but I find it very useful.

Dr. W. A. MILLS, Baltimore. This is a very interesting subject to me; one that I have made careful study of from the time I began practice. Neuralgias, and especially tic douloureux, should be studied very seriously, and I am very sorry to say that there are many in our profession who seem to think they should have nothing to do with it. It is true that many of us know very little about it, but many of the general practitioners know less when the symptoms are manifested in the oral cavity or contiguous structures. I know one case where a lady had every tooth extracted, one at a time, to get relief from what she sup-

posed to have originated in a tooth, but it did not give the desired relief. After all her teeth were gone she still suffered, and has been suffering ever since—about fifteen years—and I am afraid, from what I have heard from other sources, that she is now a morphin fiend. Two years ago she wrote me asking for advice, and I wrote her to give me her own and her family history, and I discovered that she had suffered with uterine trouble from her youth. I wrote her advising that the nerve be excised or stretched, as advised by her many physicians, but I have never heard anything from her since. It is our duty to diagnose and treat such cases, the same as do physicians.

This is an interesting study for all of us, and I am glad to see the younger men taking it up. The time is coming when we shall have to know more of the general practice of medicine, and the physician more of stomatology.

Dr. W. E. DIEFFENDERFER, Washington. I rise, not for the purpose of saying anything on the paper, but to ask for information. Dr. Snyder spoke of true and false neuralgia, but did not state how to diagnose between the two. I have not had any particular case of this trouble, but in my reading I come across many cases of neuralgia due to pressure on the nerve of an impacted third molar. I would like a little light on that subject. I have read of cases where the patient was treated for a long time for neuralgia, and finally the mouth was thoroughly examined and it was found that a tooth was causing the trouble, from which relief was obtained by relieving the pressure on the nerve.

In regard to physicians overlooking the examination of the mouth, I had a lady come to me to have some filling done, and she complained of an upper third molar being a little bit sore, not enough to cause any special inconvenience. I found the upper eyelid drooping and partially paralyzed. I thought the nerve controlling that eyelid was being pressed upon by pus burrowing from this tooth, and I said to her, "What are you doing for your eyelid?" She replied,

"I am having it treated by electricity. I have taken strychnin and have been under treatment for two years, but it does not seem to get any better." I told her I believed if she had that tooth extracted her eye trouble would get better. I extracted the tooth and in two days the eyelid returned to its normal condition. The physician had overlooked the possibility of the teeth causing that trouble.

Dr. H. C. THOMPSON, Washington. If we were called upon to select a line or field in which the surgeon would have permanent ground we could not have selected a better one than the one presented this morning, that of neuralgia. We all know that we have true and false neuralgia, and the successful man in the treatment of any condition, unless he diagnoses the cause of this condition, is lost. Is the blood a factor or the primary cause of neuralgia? We find dentists, as well as physicians, directing their treatment to the effect rather than to the cause. I claim that to cure a condition of nerve irritation, we must get at the source of that irritation and not treat the effect only. In order to treat intelligently a complaint and effect a cure we must seek the cause, whether it be true or false. I know a case in practice of a young woman of a decided bilio-nervous temperament, who has the history of uterine trouble. She has been to operators in New York and Philadelphia to be treated for neuralgia. The effect was treated and not the cause. She came into the hands of a practitioner who had made some study of neuralgia and who was in relationship with medical men. He was a dentist, but he went a little farther than the dentist usually goes; that is, he said to her, "Now, tell me your whole history." All she told him was that it came on without any cause. When he asked her concerning menstrual regularity she was very much surprised, but told him that the flow had been suppressed for two months. A physician was called in, the menstrual affection was cured, and the neuralgia with it. And so in the treatment of neuralgia, you cannot effect a cure by treating the effect and allowing the cause to still ex-

ist. I congratulate the gentleman on bringing out the subject.

Dr. B. HOLLY SMITH, Baltimore. It is a very difficult thing to discuss the report of a single case, and it would hardly be fair to the gentleman who made the report to disagree with him in his diagnosis and treatment. Certainly the subject of neuralgia is, as Dr. Thompson has said, an important one, and anyone who has lived, as I have during this winter, in the wake of the sequelæ of grip, and who has had to battle with conditions which were puzzling, must appreciate the importance of this annoying pathological condition. I had a case which it seems to me might readily have been mistaken for a case such as the essayist has reported. I am rather slow in accepting his diagnosis and treatment; even if it does seem unfair to differ with Dr. Snyder, I am rather inclined to think that the resection of the nerve for the condition which he has described is of doubtful benefit. Taking into consideration the great number of cases in which relief has *not* been gained through operation, I am rather of the opinion that the suggestion that Dr. Thompson has made might with propriety have been followed out. Certainly, with all the reflex conditions which we may expect in such neurotic constitutions, the patient might have had the benefit at least of a general overhauling in the infirmary.

The case which I refer to was that of the wife of a physician. After treatment from the best specialists in all the large cities, she was referred to Dr. Pennington for the extraction of a root. The root was removed, and the patient continued to suffer intense pain. The root was extracted after consultation with the surgeon under whose care she was, and who had been working hard without success to combat this intense neuralgic pain. Finally the patient came to me with her mouth in such a condition that I refrained from examination, because when she opened the mouth it would bring on one of the paroxysms of pain. It was something terrible to see the expressions on her face. It was a most

pitiable sight. Her husband, a physician who had been spending his life in relieving pain for others, stood by helpless, watching the intense suffering of his wife. I dismissed the patient from my office, going to the hotel to make an examination. I found that, whatever was the cause of the pain, there were teeth in her mouth which at least might be suspected of giving trouble. It was impossible to prevail upon either the physician or the patient to have the necessary treatment resorted to. It was finally decided to take her to the hospital to remove the suspected tooth and bore into the alveolus from which the root had been removed. The surgeon who was to undertake the operation, after questioning her and examining the condition of her heart, refused to perform the operation. Several more days were spent in this terrible agony. Finally, after nearly two weeks of suffering—during which time it was not unusual for me to be called up in the middle of the night and asked if there was anything I could suggest to relieve the pain—the patient consented to come to my office, and I found two teeth with small cavities almost under the margin of the gum, which were excavated and dressed, and the intense suffering was relieved at once. This case was not reported because it resembles many of those which have puzzled me as the result of grip. I have had several cases where the patients were operated upon, had the nerve resected, and in no case has there been relief for longer than a year or eighteen months. In no case has the relief been permanent; but only temporary in character, and for that reason it seems to me the sensible plan would be to look farther until the cause of the condition be found.

Dr. SNYDER (closing the discussion). I am very glad to have had instruction from Dr. Smith. I only feel that I did not do myself justice in explaining more fully. I must emphasize the fact that, since all other forms of treatment had been resorted to before the operation, with no success, and since in the opinion of prominent physicians an operation

was the only thing to give relief, and did give relief, this I believe to have been sufficient grounds for an operation, and I do not fear but that any fair-minded man will agree with me.

Dr. SMITH. Have you not seen a number of cases of malarial origin where relief was obtained by combating the cause?

Dr. SNYDER. A number of later authorities claim that malaria is an accompanying condition but they do not consider malaria to be a direct cause of neuralgia.

On motion the subject was passed, and Dr. FREDERICK PRIMROSE of Baltimore read the following paper:

THE NEURASTHENIC PATIENT: WHO IS HE? HOW BEST MAY WE TREAT HIM?

The difficulty encountered by the practitioner in operating upon the so-called "nervous patient" is apparent to all dentists—indeed, it makes life a burden. The terrible nervous strain, even during minor operations, exhausts the vitality of both operator and patient, and hence too often the work is improperly done, or is not done at all. These people do not die young, and improper mastication aggravates their sad condition by causing dyspepsia, malnutrition, and lithemia, to say nothing of the suffering due to caries.

Nearly every day we hear expressions from people indicating that they are subject to some nervous disorder, and the term "nervous prostration" has become a fashionable name which covers a multitude of conditions included in the neurotic diathesis.

We did not purpose giving an exhaustive thesis, but merely a suggestion which we hope may excite the sympathy of our fellow practitioners, who have had their trials and triumphs during the years of their professional career and can testify to their modes and manners of treatment, knowing well how profitable is the exchange of healthy criticism and ideas in the working out of a rational basis for treatment.

Experience teaches us to recognize the

neurotic and place them each in his respective class, varied so widely as are their conditions, ranging from a merely irritated state to insanity. We purpose to discuss the more typical forms of neurasthenia.

First let me suggest that we have here the subjects for all sorts of drugs and professional humbugs—the opium and cocain fiend, the victim to stimulants and headache powders; hence care must be exercised by the dentist that he be not instrumental in introducing one of these habits to these unfortunate people.

The most important pathogenic factor in this peculiar type of nervous system, termed “neurasthenia,” is usually inherited, or constructed by the union of parents having predominating nervous systems. The anatomical basis of this condition is unknown, but is characterized on the one hand by lack of vigor, efficiency, and endurance, affecting usually a large number of nervous functions, and on the other by signs of active derangement which may occur as positive symptoms; or there may be a failure of the mutual support and control which the different parts of the nervous system afford each other in health. Neurasthenic symptoms may be secondary to localized pathological affections in one or another part of the body; for example, errors of refraction, lithemia, uterine disease, diseases of the brain and spinal cord. But the condition which, as dentists, we meet and are called upon to treat in our particular specialty is a primary nervous weakness, a departure from health, a predisposing and hereditary condition.

Dr. Albutt gives a true picture of this variety of neurotic: “He enters your room with a brisk step and a quick, observant eye. You see a slightly-built, meager man of sallow complexion—or there may be color high up on the malar bone. The cheeks and temples are hollow, and the temporal arteries are visible under the lean skin, which often shows tanned markings, deepened during attacks of pain. The hair is straight, sparse, and fine. The features are sharp and often prominent, the lips thin and

skin dry; and some remnants of eczema may be seen about the chin and ears. The bodily frame is lightly and often finely built, the bony fingers and wrists and the visible sinews and radials betraying the absence of fat. Here and there in later life a knotty knuckle may tell of gouty parentage. The pulse, usually normal, accelerates on the least excitement; the heart’s apex may be seen to beat sharply before the eye; the systole is sharp and quick, and the second sound is audible over a large area. Such persons are as active as birds. Their conversation is lively and voluble, and often keen and brilliant, and you may notice some little blinking, twitching or tattooing trick, which quickens as thoughts and words come faster. He is subject to great fluctuations of animal spirits—gay, even fascinating in society; brisk, orderly, and thorough in business; but at home dejected and fretful. He is a small eater and light sleeper and a worn worker. These persons are heirs to every neurosis from toothache to insanity. When we consider the infinite perturbation of intermarriage, is it surprising how true they run, and how clearly you may detect the neurotic in mixed descendants?”

Such a person as above described entered our office some time since and applied for a full upper denture of artificial teeth. Not a tooth had he in the superior alveolar process, not a molar in the inferior. The few remaining lower oral teeth indicated that they were of excellent quality. These people are generally of the nervo-bilious type, and have beautifully formed teeth of excellent quality. In answer to the question as to how it was that he had been so unfortunate as to lose his teeth he replied, “They were extracted because of neuralgia.” This neurotic had suffered all his life from attacks of pain in the occipital region; any exhaustion mentally or physically occasioned an attack, and after his physician had tried and tried in vain to cure him, he advised the removal, one by one, of his teeth, thinking each one was the cause of his distressing condition and that its removal would be

followed by mighty results. Hence this edentulous victim, whose condition was far worse than in the beginning; a great wrong had been perpetrated. They might have removed his eyes, ears, or nose with the same amount of intelligence as they did his teeth. The dentist, even when authorized by a physician, ought not to perform such dastardly and ignorant operations.

But yesterday we were called upon to treat a lady of wealth and refinement, a born neurotic—hereditary through her father's family. Every ill and discomfort was magnified a thousandfold. She had spent money galore on every specialist, the dentist included. Now, this lady's particular trouble was attacks of pain situated near the inner canthus of the left eye. Here, as in the other case, physical or mental exhaustion induced pain, but, fortunately for her, her teeth had been spared. She was the victim of a certain headache powder. So much of this preparation had she used that the veins in the sublingual region looked like black worms when the tongue was raised.

A healthy organism should respond to calls upon it with an elasticity like that which the cushion of a billiard table responds to the blow of a ball; and the man or woman of to-day, especially the American, who possesses such an organism should be indeed thankful for the greatest of all gifts. With the neurasthenic the condition is not as described. A trifling impression arouses inward reaction, and hence these persons suffer dyspepsia, disorders of sleep, collapse of strength, and general exhaustion. The teeth of these neurotics are in sympathy with other disturbances, and the great difficulty encountered in operating on account of this exaggerated reaction is the thorn in the dentist's flesh. We are called upon to stop a toothache, and so misleading are the statements given by the patient that the greatest care must be exercised or a blunder will be committed. Every opportunity is afforded to make a wrong diagnosis, and only great practical knowledge gives a correct solution.

It may be that we are called upon to

extirpate a pulp and use whatever method we desire, cocain or arsenic. Ten chances to one that tooth will give trouble, and the operator, if inexperienced, will pass many a restless hour, expecting to have a case of peridentitis ending in alveolar abscess, with all its horrible results. But this seldom happens, because his fears have been excited by exaggerated expressions, especially if at some unguarded moment the operator gave an opinion that the tooth might give a little discomfort during the next few hours. The patient's mind at once centers upon the offending member, and by wiggling, worrying, and grinding, the tooth becomes more sensitive and the patient more irritable. After many troublesome visits quietude is reached and the dentist breathes freely once more. These people do not spare your feelings; but keep cool, do something, or pretend—a touch of iodin, a capsicum plaster, will often satisfy, and if perchance anything fortunately should occur to divert his mind the patient soon forgets the tooth.

The hypersensitive state of the dentin and the nervous condition of the neurasthenic renders cutting in most cases extremely difficult and often impossible, and many modes of operating and numerous obtundents have been given the profession—some good, some useless, but none ideal. Now, in extreme cases, when cocain and sharp instruments and manipulative skill have been taxed to their utmost, what are we to do? Is there nothing that will quiet the patient and render the operation painless? We answer, Yes—chloroform! Nothing seems to have this twofold effect like this drug. It quiets the patient by relaxing the great nervous strain and renders pain almost *nil*.

Now, by this we do not mean the indiscriminate use of chloroform, nor to the extent of anesthesia. A few inhalations over the top of a wide-mouthed bottle in which a few drops have been poured will bring about a happy result. A little training will soon teach the patient what is required, and when the lips have a slight sensation of numbness,

although the consciousness of the individual is not affected to any great extent, we can operate with comparative ease. The writer would not submit to the torture of having a tooth excavated without first inhaling a few drops of chloroform. For far less painful operations the surgeon would advise the administering of an anesthetic to its full extent. Then why should not the dentist use it in these extreme cases, to its initiative stage? We have used it, and seen it used time and time again, and with no deleterious effects. We do not claim originality in administering chloroform after this fashion, as it was given the profession long ago, but the word "chloroform" raises such a degree of antagonism and fear that it is seldom used by the profession. We consider the danger far less than when cocain is used subcutaneously, even in minute quantities; yet we do not hesitate using the latter drug constantly. We should only condemn the use of anything through our experience in its use.

We consider half an hour for minor operations long enough for one sitting. We need not say that all instruments should be in perfect order; a dull bur has no place here. Every act must count. Delicacy of touch and exactness in operating must be learned long before the operator is required to operate on these people. Kindness, confidence, and authority are required. An irritable operator easily finds an irritable patient. The acute ear and watchful eye of these people are ever on the alert; hence every act of the operator should be guarded and positive answers be given. Doubt leads to fear and loss of confidence. Deception works no good, and everything liable to shock should be avoided. Know yourself, study the patient, and keep your temper.

Discussion.

Dr. B. HOLLY SMITH, Baltimore. I do not agree with the essayist in his reckless manner of giving chloroform. I do not think he is right in getting up before these young men to advocate this promiscuous use of chloroform, as they

might think it is a safe thing to do. How many cases of fatal results have followed administration of chloroform in the dental chair, not only after patients have been carried well under its influence, but even with the first inhalation of the chloroform. I do not know how many times the doctor has administered chloroform in this manner, but I hope he will stop it before he has a fatality. I do not think we have the right to resort to such serious means when there are others at our hand which do not involve such great risks. The fact that Dr. Primrose has had no untoward experience with it is not a sufficient guarantee of its safety; it does not mean that he will not kill someone to-morrow. I hope he won't!

Dr. M. F. FINLEY, Washington. I would like to commend Dr. Primrose for bringing this subject to our attention, although I somewhat agree with Dr. Smith that it is a dangerous procedure, especially with the patient in an upright position. I have had many requests for it which I have invariably refused. I recall one case where I operated with the aid of chloroform, but the patient did not take it with my advice or responsibility. She was the wife of an army surgeon and said she had taken it many times, and knew how to use it, so I consented to her using it, but she had to take the responsibility on herself. She was in my office probably a dozen times after that, and always used the chloroform. She would inhale until it would begin to take effect, and at her sign I would begin to operate, and it relieved this patient almost entirely of the pain of the operations. I could never consent to the use of chloroform myself on patients as directed by Dr. Primrose.

Another point in his paper is the ability to control ourselves in the presence of these neurasthenic patients. They are extremely irritating, and of a very sensitive nature. They criticize our every action. I think there is a good deal to be considered in our management of patients. We must know them thoroughly before we can be severe. If we permit ourselves to be too easily influ-

enced by the expressions of such patients, we will die young. We need to know how to manage them as a means of self-preservation.

Dr. H. F. R. SNYDER, Baltimore. I realize that the young men should be seen and not heard, but I cannot help but disagree with our honored authority, Dr. Smith, in regard to some of his remarks. As far as Dr. Primrose's ability is concerned, I think he is just as capable of giving chloroform as if he had the M.D. degree. We are not anxious to transgress upon the domain of the medical profession, but are anxious to give our patients everything we can to help alleviate pain and suffering, just as is the medical man. I see no reason why the dentist should not administer chloroform when it is indicated, if he has the ability to do it. I see no reason why he should not be able to use any anesthetic as properly and as successfully as the medical man. A few days ago, at the University of Maryland commencement, the class orator expressed in a very able manner what I am trying to get at. In his remarks he said, "Gentlemen, I cannot see why the raw material in the dentist is not the same as the raw material in the physician. He is just as capable of being educated, and for my part I see no reason why he should not be." When the dentist is made to feel that medically he is thoroughly incompetent, it is usually at the hands of the D.D.S. who has succeeded in prefixing an M.D. to the humbler title. It is not on the M.D. dentist that the ordinary dental practitioner can rely in getting encouragement and sympathy in his efforts to educate and broaden himself; it is rather the full-fledged physician, who in many cases stimulates him by his kindness and courtesy to improve himself, and consequently the profession in which he labors, so that wherever the word dentist is used it may not be defined as synonymous with tooth-carpenter.

Dr. HOLLY SMITH. The subject under discussion was that of neurasthenic patients. I am responsible for having taken up one feature of the paper, but I am entirely at a loss to know why it

should finally have drifted to the discussion of the relationship between the M.D. and D.D.S. degrees. I do not want to be misunderstood. When I made the statement that Dr. Primrose should not give chloroform in the promiscuous manner that he advocates, I did not mean to intimate that he is not thoroughly capable and qualified to give it. If he had the M.D. stamped all over him I would say the same thing.

Dr. PRIMROSE (closing the discussion). I have nothing to add to the paper, except to say that if there is anything we can use that would give us the same effects as chloroform I would be glad to accept it. I do not know of anything; if I did I would gladly use it. Of course it must be remembered that we can kill a man with almost anything. I do not think there is so much danger as Dr. Smith seems to think from giving chloroform in this way; that is, breathing it through the mouth from a wide-mouthed bottle. There is sufficient air breathed with the chloroform to prevent its dangerous effects. We know that the deaths from chloroform are almost always in those cases where the air is excluded. It is true that shock or sensation to the nerves may cause death, but what about the use of cocain and other things that are being used by dentists?

The meeting then adjourned until 8 P.M.

CLINICS.

Thursday and Friday afternoons were devoted to the following clinics:

Dr. M. F. FINLEY, Washington, showed some models of interesting cases of irregularities corrected by the Jackson system of regulating.

Dr. W. P. RICHARDS, Orange, N. J., demonstrated novel methods of applying cotton rolls and napkins, obviating the use of the clamp in the region of the molars, by small rubber bands passed over the ends of cotton rolls and then between the teeth.

Dr. A. C. BREWER, Baltimore, inserted two porcelain fillings, and also showed a method of retaining upper dentures in

flat mouths by finishing with a concave buccal surface instead of convex, allowing the muscles of the cheek to hold the plate.

Dr. A. LEE PENNEL, Leesburg, Va., inserted a large gold filling in a compound cavity in a molar tooth, using Abbey's foil with ivory matrix and finishing with Ney's soft foil passed through the flame.

Dr. W. D. MONROE, Washington, demonstrated the use of DeTrey's gold in contouring. No originality was claimed in the use of this gold. The clinician claimed that there is less strain on both operator and patient from the use of DeTrey's gold. Hand pressure was used exclusively. He also claimed that less tooth-structure is sacrificed, and that frail teeth may be saved when it would be impossible to save them with any other form of gold. This conclusion had been reached by the clinician after six years of continuous use under close observation.

Dr. J. KENDALL BURGESS, Baltimore, demonstrated the use of Pohlman's gold-plating solution.

Dr. E. E. CRUZEN, Baltimore, demonstrated his method of replacing a broken facing on a bridge, especially applicable to bicuspid and molars. From platinum plate, No. 35 gauge, he cut a piece the size of the tooth to be replaced; two holes were punched in this to correspond with the position of the pins on the bridge (pins of broken facings not removed); then on a broach the same size as pins of the tooth a piece of platinum foil, slightly wider than the length of the pins, was rolled; one of these little tubes was then slipped over each pin and the backing was placed in position over the tubes and burnished to place. The ends of the tubes were closed by simply mashing them down on the ends of the pins; the backing and tubes were removed together, and the tubes soldered to place with minute pieces of 24-karat gold. This formed the foundation upon which porcelain was built to the shape desired, after which it was cemented to place.

Dr. A. H. JOHNS, Wilmington, inserted a gold filling in a cervical cavity of the lower right canine, demonstrating his method of keeping the cavity dry without the use of the clamp, by using a ligature around the tooth and carried up over the head of the patient, keeping the gum well up out of the way.

Dr. F. H. SHULTZ, Washington, showed some porcelain bridges in which the teeth were soldered to iridio-platinum wire, backed with porcelain, and then soldered to gold crown, giving a more lifelike color to the tooth than when it is backed with gold.

Dr. GEO. L. WILCOX, New York, showed an ingenious method of expanding the arch by means of the rubber plate. He also showed some open-faced crowns.

Dr. J. A. LIBBEY, Pittsburg, demonstrated the use of two scalers for the removal of salivary and serumal calculus, suggested by Dr. T. H. Whiteside of Youngstown, O. The salivary calculus scaler was made by grinding a Butler No. 5 rapid excavator to the form of the S. S. W. regular scaler No. 2. For removing deposits from roots he uses Palmer's excavator, grinding almost to a point, giving a cutting edge on each side. The instruments were very effective for the purposes used.

Dr. CYRUS GINGRICH, Baltimore, inserted a non-cohesive gold filling in a lower right molar, using Abbey's foil.

Dr. C. R. JEFFERIS, Wilmington, demonstrated the setting of crowns and bridges by the Evans gutta-percha outfit.

Dr. H. E. KELSEY, Baltimore, showed models of irregularities of teeth.

Dr. A. J. VOLCK, Baltimore, demonstrated an electrotpe deposit for male casts in different cases, producing a perfect copper-faced die, every line clear-cut.

Dr. C. W. STRANG, Bridgeport, Conn., showed several interesting cases in orthodontia.

Dr. LESLIE LECRON, Baltimore, presented some very valuable ideas in the making of bridge work.

(To be continued.)

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

Regular Monthly Meeting, April 1903.

A REGULAR meeting of the Central Dental Association of Northern New Jersey was held at Achtelstetter's, Newark, N. J., on Monday evening, April 20, 1903, with President Pruden in the chair.

The Secretary having called the roll,

The President made a few introductory remarks, thanking the members for his election as presiding officer.

Dr. E. A. BOGUE of New York then read a paper on Ethics, an epitome of which follows:

ETHICS.

Mr. President and Gentlemen: Nero is one of the most widely known names in history; the most detestable character that ever sat upon a throne and wielded the power of a great nation. We seek in vain for any redeeming traits. When, finally, in a frenzy he caused Rome to be set on fire in many places at once, that he might sate his appetite for horrors in a view of the burning capital, and the people arose and demanded vengeance, Nero in his craven fear turned most naturally to lying, and accused the then few and helpless sect of Christians of having done the nefarious deed. At once there arose a persecution so wide, so cruel, so bloody, that in Rome itself but few of the despised sect remained alive. Nero's life was a life of selfishness unrestrained. Nero was an entirely unethical personage.

Kedney expresses wonderment that the ideal of a human brotherhood, and the adjustment of moral duties thence arising, did not enter into the minds of the Greek philosophers. It seems to us so easy. But in the Greek times the political conditions for the realization of an ideal of human brotherhood did not

exist, nor did they think it possible that they could exist. It was in the Roman dominion, with its quasi-universality, that first dawned clearly upon the human mind the possibility of such a brotherhood being realized. Its feasibility has been growing more and more distinct for the imagination ever since.

That out of the bosom of the most exclusive of all peoples, the Jews, should have arisen the One who first gave the conception distinct utterance is, to say the least, a notable event in the history of humankind. It was then that was announced for the first time, in that most marvelous of all discourses ever given, the Sermon on the Mount: "Give, and it shall be given unto you; good measure, pressed down, shaken together, and running over, shall men give into your bosom. For with the same measure that ye mete withal, it shall be measured to you again." Owen Meredith has well put the matter when he says: "We are our own fates; our own deeds are our doomsmen. Man's life was made, not for men's creeds, but men's actions." And almost the same idea is expressed by George Eliot in "Adam Bede:" "Our deeds determine us, as much as we determine our deeds."

I infer that every gentleman before me is a practitioner of my craft. It is scarcely sixty years ago since the Medical College of Baltimore refused to acknowledge that dentistry was in any sense a branch of medicine. It is scarce six months since His Majesty's Privy Council decided to continue the present course of dental teachings in England, lest any change in the present curriculum might result in the severance of dental surgery from general medicine.

In America we have recognized that

the best way to learn to do a thing is to do it, and we have often started doing it before our minds were sufficiently stored with the knowledge of the past, or even with the principles that underlie our doing. There are, consequently, some matters connected with the higher portions of our profession that have been more sedulously pursued by strictly medical men than among dentists. Among these is that intangible, but quite perceptible, actuality called Ethics—which means morals. The lower down in the scale of humanity the less the knowledge of morals, because there are no morals to have knowledge of; but as civilization advances, ethics, or the knowledge of morals, becomes more widely disseminated, until we reach a strictly Christian community, when the science crystallizes itself into the aphorism promulgated by the Divine Leader of men: "As ye would that others should do unto you, do ye even so to them." A Golden Rule indeed, and the epitome of all codes of morals, or codes of ethics, which have ever hitherto been devised.

In all civilized communities there are individuals who are backward, and who have not reached the level of the others. For the backward ones, "codes" of ethics have seemed necessary, and have been adopted, specifying one thing after another with the dictum "Thou shalt" or "Thou shalt not" attached.

Man started out on his career as a predatory animal, going, like Satan, up and down in the world seeking whom he might devour. To-day the highest intelligences have become convinced of the value of Christian teachings, and that the highest ethical culture, the greatest unselfishness, and the utmost kindness of each to the other are the best, and are even the most profitable when considered from the lower standpoint of business morals. The greatest among us are those who are seeking what they can give, and not what they can get.

Francis Bacon, in his preface to the "Elements of the Common Law of England," says: "I hold every man a debtor to his profession, from the which, as men of course do seek to receive countenance

and profit, so ought they of duty to endeavor themselves, by way of amends, to be a help and ornament thereunto." How many among us have sedulously pursued this course, and have so striven to direct not only our own individual courses, but the courses of those bodies with which we are professionally connected, as to acquit ourselves of the duty we owe to our profession? And yet a society is but a collection of individuals, and is subject to the same laws as govern individuals.

When working on the constitution and by-laws of the American Dental Club of Paris, the question of adopting the code of ethics of the American Dental Association came up. One of the members of that committee said, "I have a suggestion to make, and that is that we simply put the three words, 'The Golden Rule,' in place of the usual code of ethics." The committee unanimously adopted the suggestion.

I will ask permission to add Hamlet's way of putting it:

This above all: to thine own self be true,
And it must follow, as the night the day,
Thou canst not then be false to any man.

Discussion.

Dr. STOCKTON. I was about to leave when I learned that the subject of the paper to be read this evening was ethics—a subject which I have always been interested in, and I remained to hear it. It is a subject that commends itself to every dentist; it commends itself to every man. If we would do just what that Golden Rule inculcates you would never say anything against me unless I deserved to have it said against me, and I would never say anything against you unless you ought to have something said against you. And it is often wise for us when we think that somebody has done some wrong to us—when that impulse in us comes up and says, "I would like to hit back; I would like to tell him just what I think of him," how much better if we say, Yes, I may not deserve all that, but I haven't anything to say; I have no unkind feelings against him. The time will come, if you live right,

and the grace is given to him, when he will come forward and say to you just that very thing; and how much better it is to put away those angry feelings, realizing that you are doing your duty whether he has done his or not.

Dr. ADAMS. I have been very highly edified by listening to the paper, and I feel that every word of it is true, and while we all know that there is no other precept laid before men that is of more importance and which would make us all happier than that very Golden Rule, still there are times in our lives when it is a rather difficult matter to follow it closely. We all have had, I am sure, experiences which make us think that not the other fellow alone is inclined to ignore the golden rule. I am very grateful to Dr. Bogue for having read that paper. I think it will do us all good.

Dr. TRUEX. I have been very much interested in Dr. Bogue's paper. It is a paper of such a liberal character that probably no man could take exception to it, and one the principles of which, if practiced by us all, would perhaps bring about the ideal in dentistry—doing unto others as we would have others do unto us. It is a fact that we do not always exercise all the professional courtesy that could be extended, and were we more thoughtful and kind toward our fellow practitioners there would be much more consideration extended in all directions. Such papers elevate the standard of the profession that we profess to love and desire to elevate.

Dr. ADELBERG. While thanking Dr. Bogue for the beautiful paper which he has read this evening, and while it is very noble, very kind, and very heart-stirring to offer—to utter these sentiments, it is very difficult for us to follow them. There are points for us to consider as professional men which the paper has not touched on. Words fail me, because I know the sentiment of this meeting is very much in accordance with Dr. Bogue's paper, but there are things that he has not said that I expected he would say.

For instance, how to run a dental society from an ethical standpoint and in an ethical manner. I know this quota-

tion from the European society is very nice, but I think it would not hold good under different circumstances. I think if we should adopt that same system or code of ethics we should not get along quite as well. I think we need another code; before the Gospel we had the law. We ought to have a little bit of law to carry on the proceedings of the dental societies. There is a great deal in the gospel of "Do unto others as you wish to be done by," but there is another thing in making others do as you wish them to do, by you and others, too.

I am not a speaker; I can't talk. I would like to say just what I have in my mind; but I think, Mr. President, that a great deal could be said on the point, and on the question of ethics for dental societies. We have a dental society that has a reputation second to none, and still we have a good many things from an ethical standpoint we have to be ashamed of—hang our heads before societies more ethical; and while I do not wish to particularize those items, I say that it would be a very good thing if our society had a committee on ethics; if I am not mistaken we have not such a committee.

The PRESIDENT. One will be appointed to-night.

Dr. ADELBERG. If that be the case I feel that the paper has not been read in vain, and with such information I am willing to take my seat.

Dr. VINSON. I think that what Dr. Adelberg refers to is that we have not adhered to our code of ethics as we might. I have known of several instances where we have possibly sinned, but I think from now on we will sin no more. I understand we will have a committee on "code of ethics," which comes before the Executive Committee, if I remember right. I suppose we haven't been quite as strenuous as we might have been since we became banded together in a fraternal way, and possibly some of our members have stepped over the line a little bit, but I think we will not do so any more, from what I can understand.

Dr. LUCKEY. I was told that ethics was to be the doctor's subject. I have

often wished that we were able to live in a brotherly way as dentists without organic law, without a code of ethics, and I hope the day may come when we may so live, when the law will not be quoted by one brother to another possibly erring brother to bring him to a realizing sense of his position; when one man will do unto another as he would have him do unto himself. Whether that will come while human nature is as it is, is doubtful; that it will come while human nature is as it is at present in the dental profession, is absolutely impossible. There are some good men—some men who strive to fulfill their mission in life toward their fellow-men as they see the light and as they see the way, honestly and faithfully. There are many others, though, who do not, and it is for those others that we must have these laws—this code of ethics. It is unfortunate that the code of ethics does not hold some of these erring brothers to the straight and narrow path; it probably never will. I sincerely hope this golden day may come, although I have no present faith in it. The test of every professional man is his daily work—the way he treats his professional brother, through those patients who come to him from that brother—whether he treats him just as he would be treated himself.

Dr. BOGUE (in closing): I was about to make my thanks to you and sit down, but with your permission I will make my thanks first to Dr. Luckey. There are certain persons in a community that are behindhand—far behind the rest of the world. Those are the ones we want to help up. Dr. Luckey and I are going to lend a hand to anyone that wants to be helped up.

My friend Adelberg—he and I have been trying to quarrel year in and year out, but we cannot make it out. But I am not going to agree with him at all that we cannot live outside of our Sunday-schools just as well as in them.

In conclusion, Mr. President, I am going to ask your permission to refer to

a strictly dental matter. Now, I wasn't told to refer to dental matters when I was given the subject of ethics to talk on, but two gentlemen have shown me models of cases this evening, and they have brought to mind some more models of cases that come before my mind almost every day. Has it occurred to you, my brethren, that teeth change from year to year—that the teeth to-day do not stand in anybody's mouth where they did four or five years ago? If you think that is strange doctrine just take a few models, and then take models from the same persons five or six years hence. You will find very often, where extractions have been practiced, that the teeth have changed position so much that the lower cusps—strong teeth—will split off, an inside cusp or outside cusp of the upper teeth, bicuspid especially. Such a reference is in my record to-day. I dictated to my secretary this: "If you should find in some unfortunate patient's mouth that owing to extraction the teeth are occluded differently from what they once were and certain lower cusps are working upon some of the inclined planes above in such a manner as to endanger the fillings put in by yourself or some other practitioner, or even to endanger the tooth itself, it would be quite ethical to grind down that filling or an occluding surface and so prolong the life of the filling or tooth, or both, just as you would want it done for yourself." To claim that conditions brought into being by lapse of time which endanger the patient's well-being is not your affair is to ask over again the question of Cain, "Am I my brother's keeper?" If it be not "doing the things we ought not to have done," it is "leaving undone the things we ought to have done."

A vote of thanks was then extended to Dr. Bogue.

The regular business was then taken up.

The President appointed the following gentlemen as the Committee on Ethics: Drs. Hane, Gregory, and Woolsey.

On motion adjourned.

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Devoted to the Interests of the Profession.

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PHILADELPHIA, NOVEMBER 1903.

EDITORIAL DEPARTMENT.

“THEORETICAL” OR “PRACTICAL” STUDIES.

THE attitude of mind of a large majority of students upon entering upon the study of dentistry is at least in one essential feature so markedly in opposition to the aim and purpose of dental education that we venture to express a few thoughts thereon.

We refer particularly to the tendency of establishing a dividing line between the so-called theoretical branches and those generally accepted and recognized by students as “practical.” This division, which is, we think, purely imaginary, has, however, a detrimental influence by diverting the student’s mind from the consideration of those subjects which experience has shown to be indispensable in solving those questions in operative and prosthetic dentistry which have baffled the ablest “practical men.” This division of the curriculum into two groups, “theoretical” and “practical,” is based upon an erroneous conception of the relations of the essentially dental subjects to those branches which at a glance do not seem to bear any relation to practical dentistry. By practical we here imply operations in the execution of which manipulative skill is an important and necessary factor. Either on account of lack of proper knowledge or because of biased criticism, those who thus argue forget that a large degree of the success that may be expected from dental operations is due to the fact that their manual execution is carried out on lines which, as a matter of fact, are the result of careful scientific experimentation. Such subjects as histology, general anatomy, physiology, chemistry, and bacteriology are viewed by dental aspirants with much uncertainty as to the direct practical

benefits that may be derived from long hours spent in endeavoring to absorb knowledge of that character. This attitude of mind is partly due to a mistaken understanding of the relations which these subjects bear to the problems which daily confront the dental practitioner, and partly to imperfect methods of teaching.

That dentistry has reached the relatively high degree of development in which we find it to-day is the result of conscientious and painstaking investigation of problems which before they were scientifically solved led practitioners to follow lines of procedure that in many instances aggravated instead of cured the condition confronting them.

The indispensable function which the theoretical branches play in the solution of dental problems of a practical character, and in helping to successfully perform operations strictly within the sphere of both operative and mechanical dentistry, may be demonstrated in many ways.

The problem of dental caries, which has occupied the attention of the dental world probably since the first case of tooth-decay was observed, with our present conceptions of its nature and treatment affords an obvious example of what has been accomplished through scientific experimentation. Bacteriology and chemistry have been of the utmost importance in the study of the etiology of caries, and we believe we are strictly within the truth when we say that without a reasonable insight into these subjects no light could have been thrown on this obscure field of special pathology. Nor could rational treatment have ever been devised without a knowledge of the cause and pathological anatomy of this malady.

The second step in the rational treatment of dental caries, the technique of cavity preparation, as worked out by Black, Johnson, and others, is the result of a continuous study of the histology and macroscopic anatomy of the teeth. The preparation of cavities is based upon scientific data, inasmuch as their shape and outline are fashioned in accordance with the anatomical and histological characteristics of the teeth in view of securing solidity of the filling inserted and adequate resistance to the ravages of recurrent decay, avoiding at the same time the possibility of injury to the pulp.

It is of the utmost importance that students should be made to understand and to see for themselves the advantages that may accrue to them in the practice of their chosen profession from a reasonable knowledge of the theoretical subjects under consideration. We believe it to be the duty of teachers to point out in their lectures and recitations the relations which their particular subjects bear to practical dentistry. The connecting links between anatomy, physiology, chemistry, bacteriology, etc., and the actual practice of dental surgery should be made plainly evident to the student, thereby assuring his interest in the study of subjects which otherwise he is apt to regard as the decorative part of the curriculum rather than what they really constitute—the solid foundation of the science and art of dentistry.

THE SOUVENIR MEDAL OF THE FOURTH INTERNATIONAL DENTAL CONGRESS.

WE present herewith an illustration of the medal authorized by the Committee of Organization as a souvenir commemorative of the Fourth International Dental Congress, to be held next year in St. Louis, Missouri, August 29th to September 3d, inclusive.

The figure upon the obverse side—that of St. Apollonia, which has been selected to typify dentistry—is one which not only serves the symbolic end, but one which lends itself particularly well to artistic treatment. The original design from which our illustration is reproduced is an artistic representation which has both merit and beauty.



The symbolism of the reverse of the medal has been given ample consideration, and it is such, we think, as should meet with general approval. The universality and international character of the Congress movement is typified by the continental divisions of the world. The associated dates at the top of the design are those which embrace the professional life-history of dentistry. Falling gracefully down between the continents is a scroll upon which is to be inscribed the names of the recognized fathers of dentistry in all countries, each national body being asked to nominate the name or names to represent the respective countries. The pose of the eagle represents the auspices under which the Congress is to be held, and the palm branch a tribute of honor on behalf of the American profession to the fathers of dentistry.

The execution of the dies will be entrusted to the most expert die-

sinker in America. The design will be in high relief, and the medal will be struck in bronze, and will be about two and one-half inches in diameter. It will be a finished work of art in all respects, and an attractive and interesting souvenir of the great meeting which it typifies.

The medal will be supplied only to those who make application for it in advance of the Congress, as the number struck will be limited to the number subscribed for. The price of the medal without a case has been fixed at five dollars. Cases for the medal will be furnished at prices corresponding with their character and quality.

THE ARMY DENTAL CORPS.

WE find in the *Army and Navy Journal* the following interesting data with reference to the present status of dentistry in the army:

“Surgeon-General O'Reilly has recently received reports showing that many things are yet needed to bring dentistry in the army up to an efficient standard. According to these reports, many of which have come from department commanders and army surgeons, there should be a large increase made in the number of dental surgeons. It has also been suggested that it would be well to provide at each army post a suitable operating room.

“The dental surgeons are experiencing considerable difficulty in getting enlisted men in the army to properly attend to their teeth. A proposition is now under consideration by the medical department of the army to have the dental surgeons give lectures to the enlisted men under their charge on the urgent necessity for the care and preservation of the teeth.”

BIBLIOGRAPHICAL.

PRINCIPLES AND PRACTICE OF CROWNING TEETH. By HART J. GOSLEE, D.D.S., Professor of Prosthetic Dentistry and Crown and Bridge Work, Chicago College of Dental Surgery, Dental Surgeon to the Attending Staff of Cook County Hospital, etc. New York: Consolidated Dental Mfg. Co. London: Claudius Ash & Sons, Ltd.

The papers on crown and bridge work, by Dr. Goslee, serially published in the

Items of Interest, have been gathered in the attractive volume now before us. It is a systematic and comprehensive treatise on the art of crowning teeth, and embodies, besides the methods advocated by the author, descriptions of devices which on account of their usefulness and applicability are widely employed in dentistry to-day.

The work is divided into fifteen chapters, comprising a study of those subjects

a knowledge of which is essential for the successful construction and adaptation of crowns.

It has been the reviewer's experience that of the many and difficult prosthetic requirements that dental students are compelled to fulfill during their college course, none are viewed with greater uncertainty as to the attainment of successful results than those in which it becomes necessary to unite metallic surfaces by the soldering process. It is therefore with exceeding satisfaction that he has perused Chapter III, wherein this subject is so well elucidated that its careful study by the student will convey to him a clear understanding of this important operation in the prosthetic department of the dental art.

The preparation of roots is described in Chapter VI, and in the twenty-one pages devoted to this purpose the author describes the method of preparing roots

for the adaptation of different varieties of crowns. As the preparation of roots for the reception of artificial substitutes is the most important step in the process of crowning teeth, the author has treated the subject from its different aspects and to its fullest extent.

In the other chapters he discusses practically all operations within the realm of crown work, such as the "Shell or Telescope Crown," the "Shell or Telescope Crown in Combination with Porcelain," the "Band and Dowel Crown," the "Plate and Dowel Crown," the application of "Dowel Crowns without Plate or Band," the application and construction of "Porcelain Crowns," the composition, characteristics, and manipulation of "Porcelain Bodies," with the finishing, polishing, and mounting.

The book is profusely illustrated, and the presswork is carefully done.

J. E.

REVIEW OF CURRENT DENTAL LITERATURE.

[*La Odontología*, Madrid, July 1903.]

HYDROGEN DIOXID IN DENTAL THERAPEUTICS. BY DR. A. FERRARI, ALICANTE, SPAIN.

For medicinal purposes hydrogen dioxid should be absolutely free from any of the substances with which it may be contaminated in the process of manufacture. In many cases the presence of sulfuric and hydrochloric acids can be detected, also that of phosphoric acid, which is sometimes added to prevent its decomposition. The pure drug is advantageously employed in dentistry in the treatment of all varieties of stomatitis, especially in the so-called mercurial stomatitis. Here it acts as a deodorant, removes the products of decomposition covering the gingival border, and in a general way is of great usefulness in the specific treatment of this malady. Its therapeutic value becomes at once evident in the treatment of pyorrhea al-

veolaris and of the varieties of buccal infection frequently found in diabetics and albuminurics. In caries of the fourth degree a three per cent. solution injected in the root-canals disinfects the diseased region with no danger of objectionable after-results.

For bleaching purposes the author suggests that it possesses the excellent property of being neither caustic nor toxic. This statement in the reviewer's opinion applies only to weak solutions, as the concentrated ones are both toxic and caustic; further, as the weak solutions are rarely employed for bleaching teeth because of their lack of chemical stability, this statement of the author loses the scientific value he apparently attaches to it.

After a few remarks on the use of H_2O_2 in general therapeutics, the essayist gives a few useful indications as to the mode of ascertaining whether the drug is pure or contaminated. By means of litmus paper the presence of acids is readily detected, and by

means of a one per cent. solution of chromic acid it can be ascertained whether the preparation has lost its available oxygen. When a few drops of this test solution is added to a solution of hydrogen dioxid the chromic acid is instantly changed into perchromic acid, which is of a deep blue color, in contradistinction to chromic acid, which is of an amber color. A solution of potassium permanganate can also be used to detect the loss of oxygen. If the hydrogen dioxid is of good quality, the solution of potassium permanganate will be converted into a colorless liquid.

[*Oesterr.-ungar. Vierteljahrsschrift für Zahnheilkunde*, Vienna, April 1903.]

IRRIGATION OF THE PULP AS AN AID TO DEVITALIZATION. BY DR. JOSEPH SZABO.

In order to prevent the pain which usually follows arsenical applications the author recommends the irrigation of the pulp with tepid water, and continuing these irrigations, reducing gradually the temperature of the water. He has obtained very successful results with this method, which he has used in the clinic of the University of Budapest. In the cases in which he has tried it, the application of arsenic was not followed by the pain which usually accompanies its introduction.

[*Dental Brief*, Philadelphia, September 1903.]

PRESCRIPTION-WRITING IN DENTISTRY. BY W. F. HARRAR, D.D.S.

In a prefatory remark the author calls attention to the fact that dentists in many instances entirely overlook the benefits to be derived from an intelligent application of drugs in the treatment of various dental disorders, stating that some prefer to refer these cases to medical practitioners, while others, though possessing this knowledge, prefer not to prescribe in order to eliminate any possibility of mistake. The essayist then takes up the Latinizing of prescriptions, giving a few simple rules which will doubtless prove valuable to anyone not familiar with Latin grammar. As writers upon the topic under discussion usually emphasize the advisability of using Latin in writing prescriptions, the reviewer ventures to express the opinion that, while that language is perhaps necessary in the case of prescriptions by medical practitioners, for several reasons—among which may be mentioned the casual need of concealing from the patient the nature of the ingredients prescribed—it is not indispensable in the case of dental practitioners; and many dentists

who perhaps refrain from writing prescriptions because of a lack of Latin training could do it satisfactorily were they to use English instead of Latin.

We are past the era when the ability of a practitioner of medicine was rated by his familiarity with Latin, or his tendency toward polypharmacy, and to-day it is only by his knowledge of the nature of the phenomena he is called upon to treat that his status will be decided. It should not make the slightest difference whether his prescriptions be written in English or in Latin. Let it be English if so the possibility of error can be avoided; and a greater number of dentists can then be induced to prescribe in those cases in which the general disorder is either the cause or the effect of some dental disorder. The reviewer wishes to emphasize the fact that he does not oppose the use of Latin in connection with prescription-writing by dentists, his object being merely to point out the fallacy of holding that prescriptions should perforce be written in Latin and not in English should the latter method facilitate the purpose in view.

Dr. Harrar, after pointing out a few errors commonly witnessed in prescriptions, concludes his paper by referring to some of the combinations wherein the dentist is most likely to err. Of these combinations a few will be enumerated:

1. The "precipitation of alkalis of an insoluble salt by the addition of one solution or salt to another." For example, the soluble salicylates are decomposed by acids and the nearly insoluble salicylic acid formed.

2. The addition of alkalis, alkaline salts, or salts to alkaloidal salts will produce insoluble compounds. Alkaloids, in order to make them soluble in water, are converted into a salt by the action of an acid. Now the addition of an alkali will displace the alkaloid, which will be precipitated. Alkaloidal salts should be prescribed alone.

3. Acids are incompatible with alkalis, acetates, and metallic oxids.

4. Alum with alkalis and alkaline carbonates.

5. Potassium chlorate with mineral acids, organic substances, sulfur, carbon, calomel.

6. An acid should not be added to a tincture.

7. Tannic acid should never be added to solutions of alkaloids.

8. Fluid extracts are incompatible with water.

9. Alcoholic solutions of camphor and resinous substances cannot be mixed with water.

10. Vegetable acid salts are changed by mineral acids, and decomposed by alkalis.

11. Calomel and antipyrin are incompatible.

12. Aconite should be ordered in water alone.

13. Pepsin cannot be given with alcohol or tinctures.

14. Medicated waters with salts will cause precipitation—a frequent experience with dentists.

15. Oxidizing agents must never be added to organic and readily oxidizable substances.

Finally, in writing a prescription care should be taken to adapt the number of doses to the probable length of time during which it will be necessary to use the medicine. To write a prescription containing a quantity three times as great as may be needed is not always appreciated.

[*Archives de Stomatologie*, Paris, August 1903.]

CONTRIBUTION TO THE PATHOLOGY OF TIC DOULOUREUX OF THE FACE. BY DR. R. NOGUÉ, DENTIST TO THE HOSPITALS.

The clinical description of tic douloureux as given by Professor Trousseau accurately pictures all the phenomena accompanying this severe malady. This disorder is characterized by very sharp paroxysmal pain along the course of one or several branches of the trifacial nerve. The patient suffers attacks of excruciating pain in either side of the face which causes involuntary contractions of the affected region. The attacks last from ten seconds to a minute at the utmost, but may recur a number of times during the day.

This is a special form of neuralgia which it is important to differentiate, for convenience of description and observation, from the ordinary trifacial neuralgia, which is characterized by painful spots upon definite areas. Facial neuralgia generally affects the supra-orbital region, the infra-orbital region, or the mental region; at times the pain is located at the point of union between the nasal bone and cartilages, on the malar point, on the inferior border of the malar bone, at the point of exit of the internal palatine nerve at the level of the alveolar border, or at the internal angle of the orbit.

When the disease develops along the course of the inferior maxillary division, the painful spots are located in front of the ear, along the course of the auriculo-temporal nerve and at the temples. The inferior dental, the lingual and the labial nerves may likewise be the seat of pain, but this variety of neuralgia which affects simultaneously the three branches of the trifacial, or either one of

them, differs markedly from the tic douloureux of the face. The diagnosis of tic douloureux is easy and cannot be confounded with ordinary trifacial neuralgia or with neuralgia the result of disturbances of the pulp.

The pathology of tic douloureux as yet remains obscure. At first it was considered as a disease by itself; it was afterward attributed to a lesion of the branches of the trifacial. In 1870, Dr. Gross of Philadelphia, in describing spasmodic neuralgia of the face, stated that it was observed particularly in individuals having edentulous jaws or spaces produced by the extraction of teeth. This, according to Gross, would be due to compression of nervous filaments along the alveolar border by calcific matter deposited in the vascular canals. Following this reasoning, Gross operated on cases of tic douloureux, removing the alveoli of the affected area. This operation brought about the cure of some cases and improved all thus treated.

Dr. Jarre has studied this disease and believes it to be the result of a nervous lesion of cicatricial nature. These nervous disturbances are caused, according to this observer, by a cicatrix of the alveolar border. These cicatricial lesions are produced under special infective conditions, the result of alveolar arthritis, or of gingivo-periostitis incident to pathological eruption of the third molar. Dr. Jarre recommends the removal of the alveolar border along the diseased area, and cases thus operated have been greatly benefited. In other cases tic douloureux may be caused, not by a cicatricial lesion, but by an infection localized upon the apical region of the alveoli brought about by putrescent conditions of root-canals. In such cases it persists while the tooth remains in position. The tooth should be extracted, but if in the extraction the pus sac be not removed it will be covered up by gum tissue and will continue to act as the direct cause of tic.

The essayist emphasizes the necessity of ascertaining whether any pus sacs are present within the osseous portion of the jaw, as, in some cases of tic, deep cauterizations of the mucous membrane covering the alveoli have given satisfactory results. In other cases, however, tic is the result of an impacted tooth, which produces these spasmodic and painful contractions by compression of nervous filaments. To recapitulate, we will say that it may be caused—by pericementitis; by the presence of osteophytes in root-canals, producing mechanical compression of the sensitive nervous filaments; by the chronic or acute inflammation of the mucous

membrane lining the walls of the antrum of Highmore; by compression of the inferior dental nerve by the roots of the third molar; by infection of the inferior dental nerve or canal, and by suppuration from the alveoli of the third molar. Lastly, the presence, although seldom observed, of calcareous deposits upon the Gasserian ganglion concomitant with *tic douloureux* shows that in some cases the cause of this disturbance may be located very far from the terminal nerves.

[*Proc. North Carolina Dental Society, Asheville, N. C., 1903.*]

PATHOLOGY AND THERAPEUTICS OF PUTRESCENT PULPS. BY ROBERT S. BOOTH.

When nitrogeneous substances are deprived of their blood supply, their vitality disappears and they undergo gangrenous decomposition. They are then invaded with micro-organisms and the process causes the formation of numerous gases of a very foul odor. The principal gas found in a putrescent pulp-canal is hydrogen sulfid, and to this gas we may attribute most of the foul odor we so often have to contend with.

Physiology teaches us that iron is present very largely in our systems and is distributed throughout the body by the red blood corpuscles, and in case of a putrescent pulp these red blood corpuscles are broken up and iron is set free. This iron readily and rapidly unites with the hydrogen sulfid present; iron sulfid is formed, and this is one of the causes of discoloration.

Regarding the well-known fact that a pulp will sometimes die and lie dormant for months or years without giving the slightest trouble, the author states that this is due to the absence of oxygen, and that as soon as air is permitted to enter the pulp-canal, micro-organisms become active, producing, in spite of all we can do, acute attacks of pericementitis, and in rare cases abscess.

We fully agree with the author in regard to the important part that the elements sulfur and iron play in the coloration of teeth. However, iron sulfid, as such, cannot be held wholly accountable for the bluish black color of a tooth which has reached the stage of permanent discoloration. The pigmentation is almost entirely due either to it or to some allied compound in which iron and sulfur, with some organic constituents, largely enter, and which by a further slight decomposition would yield to iron sulfid. (See "American Text-book of Operative Dentistry," page 538.)

In the treatment of putrescent conditions

of the dental pulp, the author recommends the use of nascent oxygen, such as may be obtained by the judicious employment of hydrogen dioxid and potassium permanganate. In this connection the author brings out a point deserving careful consideration. It is to the effect that in the treatment of putrescent pulps we should be very careful not to allow the pulp-chamber after being opened to stand open for any length of time. The sooner it is treated and healed, the less discoloration of the tooth there will be.

It is to be regretted that the author should not mention the use of sodium dioxid in the treatment of the condition under discussion. Sodium dioxid is a chemical analogue of hydrogen dioxid, and both owe their usefulness to the readiness with which they will give off the loosely combined oxygen. When sodium dioxid loses one of its atoms of oxygen, it is converted into sodium hydroxid, otherwise known as caustic soda. Therefore after the liberated oxygen has done its work in destroying the micro-organisms present in the root-canal, the remaining sodium oxid combines with and saponifies the organic matter there present, which is then removed by means of water. We know from clinical experience that sodium dioxid has given most satisfactory results in the treatment and bleaching of teeth containing putrescent pulps.

[*Lancet*, London, October 10, 1903.]

HEMOPHILIA. (EDITORIAL.)

The editor of this publication expresses his views on this hemic anomaly as follows: "Very many cases of hemophilia have been observed and yet it cannot be said that we are materially nearer a knowledge of its true pathology. It is generally accepted that there is no demonstrable alteration in the walls of the bloodvessels. The chemical composition of the blood in hemophiliacs does not manifest any abnormality and the time required for coagulation is not greater than is needed by the blood of those in health. There is, however, one important difference. When profuse hemorrhage occurs in a healthy person the coagulability of the blood steadily rises, for a time at least, so that the arrest of the hemorrhage is assisted; but in those who suffer from hemophilia the coagulability of the blood diminishes as the amount lost increases. The only point about the etiology of the disease which is indubitable is its transmissibility through the female line, the members of which are themselves unaffected, but in this hemophilia is not peculiar, for a simi-

lar mode of transmission appears to obtain in pseudo-hypertrophic palsy and other conditions. The first clear description of hemophilia was given by Sir William Fordyce in 1784, and Dr. J. C. Otto in 1803 described the disease in a family where it had occurred for nearly eighty years. Our knowledge of the etiology and pathology of hemophilia is unsatisfactory, but still more unsatisfactory is the treatment. Several drugs, such as calcium chlorid and ergot, have been credited with some power in stopping the hemorrhage, and probably in some cases they do good, but certainly in other cases they do not prove of the slightest avail. It is to be hoped that preparations of the suprarenal gland will be of use, and they deserve an extended trial, though in one particular case adrenalin solution did not arrest the hemorrhage. The most important part of the treatment is prophylaxis. As far as possible all wounds should be avoided and only absolutely compulsory operations should be performed."

[*International Journal of Surgery*, New York, October 1903.]

ON THE CURE OF LUPUS ERYTHEMATOSUS BY ACTINIC LIGHT. BY WM. S. GOTTHEIL, NEW YORK.

Dr. Gottheil thinks that a remedy for the treatment of this obstinate malady has been found in the employment of concentrated light, and more especially of the more refrangible spectral rays. Finsen used actinotherapy several years ago, and his latest reports include thirty-one cases with eleven complete recoveries, while ten cases were still under treatment at the time the account was written.

Leredde and Pautrier have treated twenty-three cases, in which three were complete failures, and three others only improved; six had segmentary cures of the areas treated, and eleven were completely cured.

A good idea of the recalcitrance of the disease can be obtained from the statement of these last two authorities that their cases had had eight hundred and two galvano-caustic seances, three hundred and eighty-two scarifications, and four hundred and sixty-two high-frequency current sessions previous to the actino-therapeusis, without the cure of a single patch.

Ravogly of Cincinnati has been successful in the treatment of a case of nine years' standing in which the nose and both cheeks were effected. Gaston, Baudoin, and Chatin had three complete and seven partial cures in their ten cases. Malcolm Morris has reported

cures, as have also Helm, Lessen, Veljaminoff, Sjögren, and others. The author has treated during the past year four cases of lupus erythematosus by the actino-therapeutic method, with one failure and three results that cannot be called other than brilliant.

[*Journal of the Medico-Chirurgical College*, Philadelphia, September 1903.]

SOME UNAPPRECIATED CAUSES OF ANEMIA IN CHILDHOOD. BY W. E. HOLLOPETER.

Dr. Hollopeter believes that the great primal cause of anemia in children, and the factor least recognized and yet most prevalent, is dental decay. In children of from six to ten years of age it is a very common occurrence to find teeth in an advanced state of decay, with a condition of pus-formation and general septic involvement of the whole alimentary canal.

In children with weak digestion and irritable disposition we are constantly correcting their habits, or administering moral suasion instead of removing the pus-generating, foul, decaying teeth. It has long been a serious question whether gastro-intestinal catarrh could ever be cured. If a septic oral cavity continues to exist for several years we feel quite sure that the individual can scarcely regain his normal vigor. With carious teeth in early childhood we will have imperfect digestion, and with defective digestion we will soon have gastro-intestinal catarrh, and its accompanying anemia.

The author advises that the child be carefully watched during the eruption of the permanent teeth, because this is concomitant with the development of the whole body, especially of the unstable nervous system. Neglect of proper care of the teeth will bring us stomatitis of every degree of intensity: ulceration, sloughing, gangrene, pyorrhea alveolaris.

In the jaws, by extension, we will frequently find periostitis, alveolar abscesses, and necrosis; owing to this septic condition of the mouth we find in the soft parts in its neighborhood, by continuity of structure, recurrent tonsillitis, pharyngitis, otitis, glandular inflammation, cellulitis, and possibly meningitis by direct extension.

The author states that some years ago the coroner of Philadelphia, a physician, informed him that fully fifty per cent. of the cases of death in young children falling under his observation were due to oral sepsis, and concludes his interesting paper by quoting Dr. William Hunter of London, who, in his ad-

mirable essay on Oral Sepsis, makes the statement that dental caries is the commonest and most prevalent cause of infection in the body; that this infection is of mixed character, including not only the harmless organisms, but also the most active pathogenic, blood-poisoning organisms—namely, the streptococci and staphylococci.

[*Deutsche Monatsschrift für Zahnheilkunde*, Leipzig, August 1903.]

DENTINAL ANESTHESIA. BY DR. THIESING, BONN.

Dr. Thiesing recommends the use of ammonia solutions for dentinal anesthesia. His experiments have demonstrated that these solutions in a majority of cases bring about anesthesia of the dentin. The objectionable properties of solutions of ammonium salts, which preclude their being used hypodermically, disappear completely when used to obtund sensitive dentin. The anesthesia of the teeth lasts from a few hours to a few days, according to the strength of the solution employed and to the length of time during which it is allowed to remain in the tooth. These solutions do not discolor the teeth and do not have any irritating action on the pulp. The objectionable and penetrating odor can be attenuated by the addition of a solution of ethereal oil in alcohol. Ammonium bromid in ten per cent. solutions produces a very feeble degree of anesthesia. Ammonium chlorid in twenty per cent. solutions, after ten minutes' contact produces slight anesthesia and no pain. Ammonium phosphid produces slight pain and complete anesthesia after five to ten minutes. Ammonium acetate produces complete anesthesia after five minutes, but at the same time it causes severe pain, which, however, lasts only a few seconds. Ammonium carbonate in solutions of five to twenty per cent. causes no pain and complete anesthesia after five to ten minutes. This is the solution recommended by the author. Caustic ammonia in solutions of one-fourth of one per cent. to which is added eight-tenths of one per cent. of sodium chlorid does not anesthetize dentin after five minutes, but after ten minutes brings about a sufficient degree of insensitivity. The application of this solution is not painful, and solutions of ten to twenty per cent. always produce dentinal insensitivity after five to ten minutes. Solutions of thirty to fifty per cent. produce good results; these are, however, accompanied by pain, which can be avoided by the addition of concentrated carbolic acid. This combination is very useful in the treatment of sensi-

tive teeth. Its effect is more rapid than that of carbolic acid or silver nitrate. He has also experimented with liquor ammonii caustici spirituosus and liquor ammonii anisati.

[*Dominion Dental Journal*, Toronto, August 1903.]

SOME THOUGHTS IN ORTHODONTIA. BY A. E. WEBSTER.

The author calls attention to the necessity of ascertaining the cause of a dental irregularity before undertaking its treatment; to treat a disease without knowing the cause is mere empiricism, and no treatment is rational which is not based upon a correct diagnosis. The first step in all cases of malocclusion is to make a diagnosis, the second is to find out the cause, and then base the treatment upon these. The first study in the diagnosis of an irregularity must be of the normal profile and the different proportions of the face; and since all faces are not alike in these respects, some standard must be taken which fairly represents the proportions of the majority of faces which are said to be pleasing to the artistic sense. The standard commonly accepted is that of the Greek type of profile, in which a straight line passing from, and touching between the eyes on the forehead and resting upon the chin, will just touch the lower lip and pass through a portion of the upper lip and through the alæ of the nose. The face in its horizontal aspect may be divided into three sections by two lines, one passing at the junction of the upper lip with the nose, and the other at the eyebrows. The lower section and the upper two-thirds of the middle section are all movable areas under the control of the dento-orthopedic surgeon. The next step toward a diagnosis is a complete and accurate knowledge of normal occlusion. Dr. Angle, after years of observation, concludes that the first molars and canines are the most satisfactory guides to normal occlusion. He says that if these teeth are in proper relation to each other the profile is usually normal. So, in the vast majority of cases, if they are brought into proper relationship the defects in the profile will disappear and the remaining teeth may be readily and easily adjusted to normal occlusion. The mesio-buccal cusp of the upper first molar should occlude on the buccal groove of the lower first molar, and the upper canine should occlude with the distal half of the lower canine and the mesial half of the lower first bicuspid. The essayist then takes up the etiology of dental irregularities, dealing especially with the deformities consequent upon

nasal obstruction and upon extraction of the first molars, and concludes his paper with the statement that in overcrowded arches extraction alone is rarely of any value. He has seen cases where as many as four teeth in each jaw were extracted at different times to overcome a crowded or bunched condition, with the result that after twenty-five years the teeth were still bunched, with an added depression of both the upper and lower lips.

[*Bull. méd. de la Clin. de St. Vincent de Paul, Bordeaux, June 1903.*]

PREGNANCY IN ITS RELATION TO DENTAL CARIES. BY DR. HENRI HOUPERT.

If stomatitis be a common occurrence during pregnancy, dental caries is even more so. The author's own observations and those of Terrier show the frequent coincidence between pregnancy and dental caries. From these observations they have concluded that it is especially during the latter part of the first month that patients suffer from odontalgia. It often reappears toward the ninth month, and it was interesting to note that some of the patients thus afflicted had never before suffered from any dental disorder.

The author quotes the opinions of several observers, especially that of Galippe, who believes that the frequency of dental caries in this condition is due to a diminution of calcium salts. He has observed that during pregnancy the density of the teeth decreases, and as the coefficient of resistance to dental caries is in direct ratio to the density of the teeth, he concludes that this diminished density is responsible for the frequency of caries. The author does not agree with these views, and in opposition to the theory of decalcification quotes Black's investigations recorded in the *DENTAL COSMOS*, vol. xxxvii, p. 417. Dr. Black showed by numerous experiments carried out with scientific accuracy that the density of teeth does not diminish during pregnancy, and that it is an erroneous hypothesis to suppose that soft teeth are more liable than hard to the ravages of decay. The mother's teeth cannot undergo decalcification for lack of nutrition, inasmuch as the phosphates in food are greater in quantity than is necessary to supply the needs of both mother and fetus. This has been demonstrated by the presence of osteophytes upon the inner surface of the bones of the skull and upon the external surfaces of the pia mater.

As the cause of dental caries during pregnancy cannot be attributed to any variation in chemical composition, we must look for it in the composition of the salivary fluids. It

is known that during pregnancy, in the great majority of cases, the reaction of the saliva is acid, irrespective of any febrile condition. Donné had already observed this fact in women during the menstrual period, and it is perfectly natural to consider that these acids play an important part in the production of dental caries. Magitot believed that the acid of the saliva is due to digestive disorders. The action of acids in the production of dental caries can be explained chemically in the following way: "However weak the chemical principle may be when in solution, if it have an affinity for a base the reaction will occur, but these reactions can be more or less intense according to the nature of the elements and to the length of time they remain in contact." This chemical reaction implies decalcification of the tooth-substance and the opening of avenues of penetration for the micro-organisms concerned in the production of the carious lesion.

The author then gives a clear *exposé* of our present knowledge of the factors concerned in the production of carious action, touching incidentally on the question of immunity and susceptibility to caries, and also on the bearing that the diathetic states have in establishing either of these conditions. The different diathetic states are responsible for the changes which occur in the chemical composition of the saliva, and, as shown by Michaels, the composition of that fluid varies and is different for each diathetic state. It would be interesting to investigate the substances present in the saliva which favor the development of caries. This question, however, is yet in its infancy. Kirk has found in all cases of true caries the presence of a carbohydrate which responded to the iodine test of Von Jaksch for glycogen or erythro-dextrin. The presence of glycogen has been reported by Salomon (*Maly's Jahresbericht*, vii, 55) and by Michaels (*Trans. Third Internat. Dental Congress*). If the carbohydrate detected be glycogen it would serve to indicate the character of the nutritional state. These points have already been recorded by Kirk (*Dental Register*, February 1903); their repetition here seems warranted, however, in view of their importance in relation to the problem of dental caries and its bearing upon the nutritional state.

The cause of dental caries during pregnancy is identical with that of dental caries in general, and its frequency during that condition is due to a diathetic state which is responsible for the production of a salivary fluid having a chemical composition suitable to the development of the bacteria of dental caries.

[*Dental Record*, September 1903.]

ROOT-FILLINGS. BY J. LEWIN PAYNE,
DEMONSTRATOR OF PRACTICAL DENTISTRY,
GUY'S HOSPITAL, LONDON.

After enumerating the properties that an ideal root-filling should possess, the author suggests that in simple cases, where the canals are not only free from septic micro-organisms, but where they can also be opened sufficiently to admit of the use of a broach, he fills the root-canals with thin oxyphosphate cement, glutol, and non-absorbent cotton wool. The root-filling is usually inserted immediately after the canal has been completely opened up and cleansed. But where there has been much hemorrhage from the apex, he inserts a dressing in order to allow the soft tissues to heal first.

His method of procedure is as follows: After obtaining thorough access to the canal, every particle of pulp tissue is carefully removed, and if any difficulty arises in obtaining direct access to the canals, the crown should be cut freely, as the conservation of the root is always of greater importance than that of the crown of a tooth. When the pulp has been completely removed, the tooth is sterilized with formalin, and then dried with absorbent wool, stiffened paper points, absolute alcohol, and finally with the electric root-dryer.

The root-filling is made by mixing together nine parts of oxyphosphate powder with one part of finely powdered glutol. This is then made into a thin creamy paste by adding and thoroughly mixing with it the liquid phosphoric acid. By means of a fine broach some of this creamy paste is introduced into the pulp-canal until it is apparently filled. Then a tiny wisp of non-absorbent cotton wool is taken and twisted around a fine broach in such a manner that it may be easily slipped off when required. The non-absorbent wool on the broach is then impregnated with the creamy paste just mixed, and is gently pushed

into the root-canal. The broach can usually be removed without difficulty, leaving the impregnated wool behind, filling the canal, but if the cotton tends to be dragged away, insert another fine broach to hold the cotton in position until the first broach has been removed. In order to completely fill large canals it is sometimes necessary to insert two, or even three, wisps of cotton so treated.

Glutol, which is used in these root-fillings chiefly for its antiseptic properties, is produced by the action of formaldehyd on gelatin in aqueous solution. It is an odorless, non-irritating, and non-staining antiseptic which constantly liberates formaldehyd and keeps the part dry.

Regarding the use of mummifying pastes, the author expresses the view that mummifying pastes are useless, for while they may cause the pulp to become dry and hard, it also becomes shrunken and only partially fills the canal, leaving room for septic matter through the apical foramen.

In the treatment of cases where suppuration prevails, the essayist advocates sealing the apex after the roots have been thoroughly treated antiseptically twice, or at most three times, and then, if further treatment be necessary, it should be done preferably through the external alveolar plate. He wisely remarks that prolonged dressing of root-canals is bad, and that as long as the apex of the tooth remains open so long will the abscess remain active. In opening up infected canals he reams out a considerable amount of tissue, in order that the dentin which has been infected may be removed and the sterilization be more thoroughly accomplished.

After the preparatory treatment is completed, he fills the apex with a dressing composed of carbolized resin, tannic acid, glutol, and thick mastic. This is introduced into the canal and non-absorbent cotton is used as in the case already described. The remaining portion of the root he fills according to the method he advocates in simple cases.

PERISCOPE.

Extracting.—It has been wisely said that "Every tooth is a key to the arch, and should be retained if possible." Nature has seen fit to provide us with a number of teeth, and man should not try to alter her laws, but endeavor to assist her. It is not the mission of the orthodontist to combat nature in the development of the jaw by extracting teeth, but it should be his aim to do all in his power to overcome the degeneracy of mankind, which seems to be more pronounced with each generation. Extracting is only permissible in very rare instances, and those cases are when the expansion would destroy the facial contour. The idea of extracting to obtain room is absurd, for room is easily enough obtained with the proper appliances.—RUSSEL MARKWELL, *Texas Dental Journal*.

Treatment of Hyperemia and Slight Pulpitis.—Hyperemia and fresh cases of slight local inflammation of the pulp may be reduced with tolerable certainty by a judicious use of oil of cloves, thymol, hydronaphthol, silver nitrate, etc. The latter has proved a very valuable remedy to me in these cases, applied in the form of powder on a pledget of cotton moistened in oil of cloves or carbolic acid, and sealed in with zinc oxysulfate. It may be left in the cavity for twenty-four hours, or even longer where the caries has not approached too near the pulp. In two different cases, where the pulps were protected by only a very thin layer of decalcified dentin, I found some months later that they had suffered a painless death without giving any disturbance whatever. I could not attribute the death with certainty to the action of the silver nitrate, though it is well to avoid an excess in such cases.—W. D. MILLER, *Internat. Dental Journal*.

Finishing the Cervical Margins of Approximal Cavities.—When inserting gold fillings upon approximal surfaces, the cervical margin may be properly finished when about one-third of the gold has been inserted. At this time it is much more accessible. When this has been accomplished a new wedge may be inserted, and a little more space obtained, so as to allow for finishing the filling at its

contact point, and still preserve the contour desired. It is well, when this is done, to see to it that the remaining portion of the cavity is retentive in shape, as there is always a doubt of the added gold perfectly welding to that already in place. As a precaution it is suggested that the surface of the gold that may have been soiled be removed before resuming the filling.—D. LINLEY PALMER, *Dental Brief*.

Hypersensitive Patients.—Most patients in the dental chair are more sensitive to the slightest sound, or touch producing sound, than the most timid woman alone in a house. A quick mind, a wide knowledge, and a quick sympathy for their mental condition can so occupy their minds as to divert the attention and center it upon other things, until those sensations fall below consciousness. To do this requires energy and vitality, and it must be remembered that the more severe the sensations the more firmly must the attention be held. The operator must, then, not only do the work, but he must literally shoulder the mental condition of the patient. While he must study the reason for every motion of his fingers and instrument, he must observe the patient as closely.—FREDERICK B. NOYES, *Northwestern Dental Journal*.

Immediate Root-Filling Contra-indicated when Canals have been the Seat of Putrefactive Changes.—A putrescent canal, with even the best possible access and cleansed out ever so well, should not be filled at the first sitting. It may cause some trouble, and why take these chances? Pathogenic micro-organisms are bound to be lodged in the dentinal tubuli, and it would be difficult to destroy them thoroughly in one sitting. We must not forget that there is a direct connection between the pulp and the peridental membrane through the tubuli and canaliculi, and if they are not put in an antiseptic condition they may cause a disturbance of the root-membrane. It may only be mild, and be gradually absorbed, but it may also result in an aggravated pericementitis, neuralgia, or other pathological conditions.—R. O. HIRSCHI, *Dental Era*.

Time to Regulate.—It seems to be the opinion of a great many men in the profession that it is necessary to wait until all the permanent teeth are erupted before attempting to benefit a case of irregularity; but it is the universal opinion of the best authorities that the proper time is as soon as the teeth are erupted far enough to get bands on them. Many a bad case of malocclusion could have been prevented by possibly removing one tooth at the proper time. We know if one tooth erupts out of line it has its effect on the entire set. I do not desire to leave the impression that teeth can only be regulated while the patient is young—for age does not make a great deal of difference so far as moving the teeth is concerned; but if we take them early in life, when the jaws are developing, the results are more satisfactory.—RUSSEL MARKWELL, *Texas Dental Journal*.

Filling of Distal Cavities in Bicuspid and Molars.—The most difficult cavities to approach are those upon the distal surfaces of the bicuspids and molars. These cavities, more frequently than others, are improperly filled on account of insufficient working room; and on this account also, these fillings are frequently improperly shaped and imperfectly finished. It is desirable, whenever possible, that the filling should completely close the interdental space at its occlusal margin so as to prevent food wedging between the teeth during mastication; it is also important that the surface of the filling, while fully flush, should not extend beyond the surface of the tooth, or as we term it technically, "overhang." To accomplish this, a little more than enough space is required, in order that when the filling is complete and the tooth resumes its normal position, it shall press firmly against its neighbor.—D. LINLEY PALMER, *Dental Brief*.

Use a Matrix when Filling Approximal Cavities with Amalgam.—It hardly seems possible that anyone would attempt to put in a mesio- or disto-occlusal amalgam filling without using a matrix of some sort, and yet I cannot account for some work on any other theory. I have recently seen some in which more amalgam was packed into the interproximal space between the teeth than was used in the filling. As for the kind of matrix to be employed, that depends, as Sam Weller would say, upon the taste and fancy of the operator. The main requirements are that the material should be thin and capable of being fitted and held to the gingival border. Thin steel sheets, or nickel or tin strips cut

for each case seem to answer the purpose, and possess advantages over fixed matrices in some particulars, as they can be bent or cut to suit and are more easily detached with less danger to the filling.—H. G. LOGAN, *Dental Summary*.

Saving of Pulps Exposed during Excavating.—Where a healthy pulp is exposed in excavating, the attempt should always be made to save it. After the cavity has been thoroughly cleaned it should be sterilized by the application of non-irritating antiseptics and the pulp immediately capped, care being taken that it does not become unnecessarily infected by the access of saliva or the use of unclean instruments, and that its surface does not become dried by long exposure to the air. As capping material everything should be rejected which does not adapt itself perfectly to the surface of the pulp without the employment of the least pressure. I invariably use zinc oxysulfate, mixing it to a thin paste. With an instrument with which I can easily reach the surface of the pulp I take up a quantity the size of a large pinhead and bring the paste, not the instrument, into contact with the surface of the pulp, when, if it is of proper consistence, it will flow off the point of the instrument and spread out over the exposure.—W. D. MILLER, *Internat. Dental Journal*.

Foreign Bodies in the Frontal and Maxillary Sinuses.—Haenisch (*Journal of Eye, Ear, and Throat Diseases*, May and June 1903) has collected the published cases of foreign bodies in the frontal and maxillary sinuses. In eighty cases the maxillary, and in thirty-six cases the frontal sinus was invaded. The bodies entered (1) through the natural orifices; (2) in the maxillary sinus through an aperture in a diseased tooth or through the opening left after removal of a tooth; (3) through the walls of the sinus. In the case of the maxillary sinus seven of the foreign bodies had entered through the maxillary foramen, thirty-five through the alveolus, twenty-eight through the walls, seven developed in the cavity, while in three the path was unknown. In the case of the frontal sinus, twenty-five of the bodies entered through the natural orifice, eleven through the wall. In nearly half the cases the average duration was one to five years. In two of the antral cases there was a history of forty-two years. Living insects in healthy sinuses caused the severest results. Small bodies were more troublesome than large ones, owing to their mobility.—C. F. M., *Treatment*.

Some Uses of Platinum Foil in the Laboratory.—(1) In those cases where it is necessary to make the addition of a tooth to a metal plate the foil does away with the necessity of swaging a small piece of plate. (2) For repairing cracks in a metal plate it is again invaluable. (3) In putting a new tooth on to an old backing, especially in those cases where the holes for the pins of the tooth have been made too large or too far apart. (4) Used for the purpose of backing shallow saddleback bicuspid and molars to be used in close bite for plate work. (5) Used for the purpose of making a porcelain-faced crown. After the metal crown is swaged by "Sharpe's" or any other method, cut out a piece with a fret-saw and fit a tooth backed with platinum foil into position; it can then be soldered from underneath, making a cement-tight crown.—D. E. CAUSH, *Brit. Dental Journal*.

Deformities Arising through Mouth-Breathing.—If a child be a mouth-breather from any reason, jaw and tooth-deformities are likely to arise from several causes. First, it has been demonstrated experimentally and otherwise that there is a general arrest of the proper growth in all the facial bones, and especially in those forming the walls of the nasal chambers. Young animals with one nostril plugged present marked atrophy, or rather deficient development, of the structures on that side. Secondly, deformity is brought about by the yielding of the yet plastic palatal arch to the pressure of the air forcibly inspired through the mouth. If the mouth-breathing be present only before the eruption of the permanent teeth, the palate may become dome-shaped, leading to an approximation of the alveolar borders so as to form an elliptical curve; the whole growth of the jaw will be more or less retarded, but the teeth will be in normal position if nasal respiration be restored. If, however, the cause continue during the second dentition the palate becomes even more elevated, forming a Gothic arch, the anterior part of the alveolus inclines forward, and the jaw assumes a V-shape. These changes produce the following alterations in the position of the teeth: the central incisors are rotated so that their lingual surfaces look toward one another and are tilted forward, while the lateral incisors, and frequently the bicuspid, are pushed inward, the molars turning outward. As the upper and lower jaws do not develop at the same rate, dental articulation becomes altogether interfered with.—A. G. MINSHALL, *Internat. Dental Journal*.

A Case of Upper Protrusion Due to Thumb-sucking.—The patient was a female, aged fifteen. The six front teeth were much spread, the tips of the central incisors being five thirty-seconds of an inch apart, and projecting nine thirty-seconds of an inch beyond the lower, which did not impinge on the gum. A rapid method of regulation was desired, the patient being home only for the summer holidays. Silver caps were made, covering the bicuspid and molars on either side, and connected by a bar of slightly flattened wire fitting round the outsides of the front teeth. This wire was thickened by slight bosses over the center of each tooth, the bosses tapped and small screws inserted; the appliance was fastened in the mouth with oxyphosphate cement in the caps. The patient was given a small screwdriver, and instructed to slightly tighten the screws every day. As the teeth were forced in, longer screws were inserted, and the front bar shortened. The teeth were in their proper position in seven weeks from commencing, and a retaining plate inserted.—A. DRAKE, *Brit. Dental Journal*.

A Therapeutic Application of Picric Acid.—A troublesome affection of the fingers, which is especially prone to occur in dressers, house surgeons, and practitioners who come much into contact with pus, is a perionychia affecting the roots of the nails. It usually arises as a redness and tenderness of the soft parts overlying the lunula and sides of the nail. If the free margin of the soft tissue where it extends over the base of the nail be separated from the latter, a bead of pus will exude and a little cavity be discovered, where this has been confined. Wet dressings appear to encourage the suppuration, and dry dressings cause the pus to become still further pent up, until very frequently it will burrow under the very root of the nail and attain its deep surface, and here it is still more difficult to reach. This trouble may be speedily cured by a little attention together with the use of picric acid. By the aid of the head of a large needle (a probe is too thick) the soft parts are thoroughly separated from the nail. A few threads from plain white gauze, or a wisp of cotton wool, are then soaked in a saturated solution of the acid, and pushed to the very bottom of the cavity. The soft parts and the root of the nail are thus kept entirely separate by this application, which should be renewed about three times daily. If this be done, the pain, inflammation, and discharge rapidly subside, and the further destruction of the young nail in its bed by the pyogenic organisms is prevented.—*Therapeutic Gazette*.

To Electro-Gild Orthodontia Appliances, Etc.—Make a solution by dissolving ammonium carbonate and potassium cyanid, one ounce of each, in one pint of rain-water. Attach the appliance to the zinc pole and a piece of pure gold to the carbon pole of any form of cell battery. Place the solution in a porcelain pan over a low flame, allowing it to boil slowly. Keep the appliance and gold in the solution from ten to fifteen minutes. The appliance will come out with a dark brown color, but after brushing it with a stiff brush filled with sodium bicarbonate, it will have a rich gold color.—J. Q. BYRAM, *Dental Review*.

Starting Gold Fillings.—One of the pleasures of filling teeth with gold is to have the first piece remain firm in its proper position in the cavity. There is nothing so effective as a thin layer of cement to aid the operator in starting gold fillings. The cement should be placed in the cavity nearest the pulp, and before it becomes hard insert a pellet of gold large enough to lap over the cement, being careful to avoid pressing the cement out over the enamel margins. The gold should not be worked much until the cement becomes too hard to spread. The cement is especially useful in minute cavities, and is a valuable aid in retaining the first pellets of gold in step cavities, both in the seat and step.—C. R. TAYLOR, *Dental Review*.

Reflex Irritation from the Teeth.—We have only to remember that inflammation is the result of congestion and venous engorgement, and we can see plainly how an irritation from an exposed pulp, from pulp-stones, from an abscess, from an impacted third molar, from pyorrhea alveolaris, or other diseased condition of the gum and mucous membrane of the mouth, may be transmitted by the nerve coming from the tooth through some of the sympathetic ganglia to the nerves supplying the bloodvessels, not only of the middle ear, but to the external auditory meatus as well, and it will readily be seen that there is scarcely a diseased condition of the ear that may not be produced by dental irritation. Twenty years ago Dr. Samuel Sexton of New York published, in the *American Journal of the Medical Sciences*, the best essay, to my mind, ever written on "The Affections of the Ear arising from Diseases of the Teeth." In reviewing the records of fifteen hundred cases of aural disease he says: "Perhaps one-third owe their origin or continuance, in a greater or less degree, to diseases of the teeth."—SAMUEL A. HOPKINS, *Internat. Dental Journal*.

How Should the Teeth be Brushed?—

In the first place we have two sets of teeth to clean, and we cannot clean them while they are closed; we must have the mouth wide open, and brush one set at a time; otherwise we shall brush our gums more than our teeth—and we can do damage to our teeth in that way. I have had many patients who had injured their teeth by brushing the gums upward from the enamel. If we have the mouth wide open, and brush one set at a time, on the grinding surface, rotating the brush so as to reach the gums, we can do no harm and can brush as long as we wish. You can brush your teeth three times a day and not injure them, but you can brush them once a day and do them harm by not doing it correctly. Keep your teeth clean, and your gums will take care of themselves. Ask your patients how they brush their teeth, and three out of five, you will find, do not know the proper way, unless they have had previous instructions.—B. Q. STEPHENS, *Dental Era*.

Origin and Meaning of the Word "Porcelain."—At the present time porcelain dental art is occupying a prominent position in the foreground of dental practice and literature. Thinking it might be interesting to some to know why this most useful and beautiful material has been so named, I will give the results of a search for the origin of the word among works on mineralogy and in various dictionaries and encyclopedias.

The first importations of chinaware into Europe were made by the Portuguese, who gave it the name "porcelain" from its resemblance to the nacre or lining of certain sea shells, those of *Porcellana Cyprea*. They supposed it was made from pulverized eggshells, fish scales, and fish glue. The porcelain shells derive the name from the Latin *porcus* (a hog), from their supposed resemblance to the back of that animal.

Kaolin is one of the principal constituents of porcelain body. It is a corruption of the Chinese *Kao Ling*, meaning "high ridge," the name of a hill from which is obtained a large proportion of this very excellent clay.—J. H. PROTHERO, *Northwestern Dental Journal*.

Painless Operations Demanded.—The ever alert and suspicious public is making a serious demand on our profession to-day for "painless dentistry." By this I mean that dental operations are expected to be practically painless. There is no drug that will aid us more in meeting this demand, if properly used, than cocain. There are but few dentists to-day, I believe, who do not use this drug for

various purposes. By the judicious use of cocain, bands can be fitted and crowns and bridges set absolutely without pain; live pulps can be extirpated, fillings inserted, and teeth extracted, with no pain except, perhaps, the dread of having these operations performed which is occasioned by past experience, and which almost amounts to pain. Valuable as this drug is in its local application, no dentist is justified in using it without a thorough knowledge of its toxic action; and in order to combat the toxic effects of cocain, which produces alarming symptoms and occasionally a fatality, we must be thoroughly familiar with the drugs that physiologically antagonize this action. This means the internal administration of such drugs as caffein citrate, strychnin sulfate, atropin sulfate, and digitalis; for there is no one drug that will physiologically antagonize the toxic effects of cocain.—J. P. BUCKLEY, *Dental Summary*.

A New Combination for Filling Root-Canals.—A root-canal filling which, though perhaps not perfectly ideal, has brought results during the last two years far beyond my expectations, is a paste consisting of a powder and a liquid. The powder is made of equal parts paraform and iodoform, and the liquid simply five per cent. formalin. Paraform, with which you are doubtless familiar, is a white, finely crystalline powder made by evaporating formalin. It is non-irritating and non-poisonous, and possesses three times the antiseptic strength of hydronaphthol. Iodoform produces the effect of an antiseptic by destroying the ptomains or poisonous products of bacteria by means of the free iodine it releases. Its local anesthetic properties are of value in offsetting the possible irritation which sometimes comes from formalin. Formalin is called, by good authorities, the most valuable antiseptic used in dentistry. Its antiseptic strength is more than ten times that of pure carbolic acid, and greater than any other dental antiseptic which does not discolor tooth-structure. In spite of its coagulating properties it is very penetrating in action, disinfecting to a sufficient depth in the dentin to dispose of what germs may not have been reached by the sodium peroxid. It is about the only agent which, sealed in a root-canal, has an effect even upon the infected tissues beyond the apex. In spite of its great power it is non-toxic. We have in this paste a filling material with which all root-canals large enough to admit the finest broach can be filled, and in a very short time. It is not claimed that all space in the canal is perfectly obliterated in all cases, nor is this condition

found with any root-canal filling, but with this material no trouble results if it is not.—G. E. PARTRIDGE, *Dental Summary*.

Classification of Temperaments.—The four basal temperaments are: *Bilious*—Hair dark, teeth of a yellowish color. *Sanguine*—Hair light, teeth cream color. *Lymphatic*—Hair light or dark, teeth dark, and rather clouded in appearance. *Nervous*—Hair light or dark, teeth pearl-blue or gray in color. The color of the hair of lymphatic and nervous temperaments is more confusing than in the case of the bilious or the sanguine temperament; it may be either light or dark.

Most individuals represent sub- or mixed temperaments. I have classed them in four groups, as follows:

Group I.—Dark hair: Bilio-sanguine, sanguo-bilious, lymphatic-bilious, sanguo-lymphatic, bilio-lymphatic; teeth are similar in shade, light cream to yellowish in color.

Group II.—Light hair: Sanguo-nervous, lymphatic-nervous, nervo-lymphatic; teeth from a cream to a bluish tinge in color. The first mentioned temperament has curly hair; the last two generally thin and straight hair.

Group III.—Brown hair: Lymphatic-sanguine, hair inclined to curl, teeth grayish cream color; nervo-bilious, teeth yellow at the neck, bluish at the cutting edge.

Group IV.—Red or sandy hair: Nervo-sanguine, teeth cream color, bilio-nervous, teeth of a bluish tinge.

In the practice of artistic dentistry we shall find the above four groups of temperaments of great assistance. Remember, that dark hair indicates cream or yellowish colored teeth, varying according to the physical structure. Light hair indicates teeth of a bluish cream or bluish tinge in color. Brown hair, teeth a grayish cream to a bluish color, as the third group indicates. Red or sandy hair, teeth a light cream or bluish in color, as the fourth group indicates.—GUSTAVUS NORTH, *Dental Era*.

Conditions where Internal Drugs are Indicated.—Take, for instance, a putrescent pulp where some of the infectious material has been forced through the apex of the root by the gases generated in the decomposition, or by instrumentation or otherwise, and an abscess is developing, which is characterized by the dull, dead, gnawing, grinding pain produced by the pus trying to bore through the alveolus—that condition in which the dentist knows, or should know, that counter-irritation gives but slight or temporary relief. In such instances as this we do not

deserve the confidence placed in us by our patients should we dismiss them without prescribing a general hypnotic—even if morphin must be given to control the pain. A prescription, however, should never be written for morphin, as the patient, being satisfied with the effect produced, could get the prescription refilled on the least provocation, and might perchance innocently acquire the habit. But in this case morphin could be given and the patient not know what drug had been taken. I wish to be understood as not advocating the injudicious, indiscriminate, or miscellaneous use of such drugs as morphin, but I desire to say that where the drug is indicated it should be administered; and it seems to me that there is no condition where the effect of morphin is more beneficial, if judiciously used, than in the case to which I have called attention. There are other drugs that can be given with marked benefit, such as codein (a milder alkaloid of opium), and many of the coal-tar preparations are valuable, among which I might mention phenacetin, acetanilid, etc. But opium, especially its chief alkaloid, morphin, is the one drug *par excellence* to stop pain, as this drug acts upon and controls the central nervous system. Alterative drugs are also indicated here; the best and most easily administered is potassium iodid, prescribed with some of the elixirs, syrups, or waters, to mask the taste.—J. P. BUCKLEY, *Dental Summary*.

Necrosis of the Jaw in Typhoid Fever.—Though necrosis of bone is a well-known sequel of typhoid fever, necrosis of the jaw is very rare. In the *Edinburgh Medical Journal* for September, Dr. G. H. Edington has published the case of a boy, aged six years, who was taken to the hospital on February 16, 1903, for a discharge of pus from the mouth. In March 1902 he had typhoid fever. The attack was severe and there were several recrudescences. In the sixth week the buccal mucous membrane and gum near the upper left temporary molar teeth sloughed, and a similar process seemed to be commencing on the opposite side. The affected surfaces were scraped and pure carbolic acid was applied. Ten days later the sloughing was checked, but after another ten days necrosis of the upper jaw on the right side was noticed. A relapse of the typhoid fever occurred a week later. On August 6th a sequestrum with a tooth attached came away from the upper right jaw. On September 6th the boy was discharged well. When he came under Dr. Edington's observation in February 1903 he was healthy-looking. There was marked fetor of the breath. The alveolar border of the superior

left maxilla, corresponding to the sockets of the temporary molars, was bare and blackish. There was a loose sequestrum and the roots of the first temporary molar were exposed and blackish. From under the retracted gum pus issued on pressure. The corresponding teeth and alveolar border of the right maxilla were absent, the gap being covered by gum. Under chloroform the sequestrum was removed with forceps, the first temporary molar coming with it. The second molar was exposed by the removal of the sequestrum, and it being loose it was removed with loose scales of bone. The blackened crown of the first bicuspid was found in the sequestrum. Keen, in his well-known work on "The Surgical Complications and Sequels of Typhoid Fever," states that bone disease is in the vast majority of cases a sequel of typhoid fever. In his table of the various bones affected the superior maxilla was involved in five cases and the mandible in two. In the case above related the necrosis was a complication rather than a sequel.

"Run Down"—Another Interpretation.

—In the *Lancet* of March 7th, p. 673, we alluded to this commonly used phrase as one which, though quite descriptive of a well-recognized mental and physical condition, conveys no meaning as regards pathogenesis. In the same article we drew attention to the question of monotony of occupation as productive of fatigue being the probable or possible cause of the condition. A correspondent, in suggesting contributive causes, calls attention to the fact that accumulation of waste products is the undoubted cause of tissue fatigue, and suggests that it probably does not much matter whether these waste products are our own or other people's—whether the material giving rise to the sensation of fatigue is derived from our own tissues by internal respiration or from the tissues of others taken in with re-breathed air by external respiration; that it is possible that the school-child may be quite as readily fatigued by inspiring the waste products of his fellows as by carrying on his own not often too pronounced mental efforts, and that the business man is more liable than the agricultural laborer to become run down, not so much because he works harder or more monotonously, and therefore personally manufactures more waste products, but because his tissues are more liable to become saturated with the waste products of himself and others, derived from the confined atmosphere which he habitually breathes. We all know how tiring to most of us is a long railway journey, more especially if the compartment is crowded and

the windows are closed. Our correspondent remarks that it seems unlikely that such fatigue should be caused by the muscular exertion of sitting on the fairly comfortable seat usually provided, or even by the mental effort of reading the usual magazine, and considers that the effect is due to the saturation of the tissues with waste products taken in through the lungs. He suggests that the pallor and blueness observable in most persons after exposure to an atmosphere highly charged with the products of respiration are due to contraction of arterioles and dilatation of venules, and that this condition is the essential factor in the production of what he calls "waste-product poisoning,"—that this condition must necessarily imply lessened metabolism and consequently lowered vitality and increased susceptibility to the attacks of the microbe—in short, a state which might be described by the phrase "run down." We think that there may be something worthy of consideration in this view of the matter.—*Lancet*.

"Taking the Bite" in Edentulous Cases.—In full edentulous cases a rim of wax, of adequate proportions to amply restore the former ridge, which is now lost by absorption to a greater or less extent, should be formed upon each base-plate, and securely attached thereto with a hot spatula. When adjusted to the mouth, the approximating surfaces of these wax ridges should each be gradually and consecutively trimmed with a warm sharp-bladed instrument, until a slight closure of the jaw will bring them into even and uniform contact at all points, with the dividing line indicating the exact length of the lower lip line. While this may require that one ridge be trimmed more than the other, or that an addition be made to one or the other, such a procedure becomes necessary, for the reason

that the lower line almost invariably indicates the correct length of the lower teeth. When this has been carefully observed attention should be given to the restoration of the middle features of the face, which should be done at this time by trimming away or adding to the wax, and is a most important detail as a means of furnishing an accurate guide to the proper arrangement of the teeth and waxing of the case. No special attention need be given to the correct closure of the jaw until these procedures have been observed, after which the patient should be requested to open and close the mouth several times—but not to "bite"—with the base-plates held firmly in their proper position, in order that their contact may be noted. This also serves to place the movements of the jaw entirely under the control of the operator; and the absence of resistance to the closure, which is made possible only by a uniform contact of the bases throughout their length, relieves the tendency to incise, and thus increases the opportunity for securing a normal occluding relation. When such a relation has been obtained the bases should be united securely with a heated spatula, or by the use of two or three small double-pointed tacks, so that they may be subsequently withdrawn *in situ*. The median line should then be indicated by making a vertical incision in the wax at the proper point, and the length and curvature of the upper lip when raised to its highest muscular elevation should be similarly designated, which latter serves to indicate the length of teeth required in the individual case. The bases should now be removed; immediately placed in position on the models; sealed to them with a hot spatula; the median line then indicated on the models, and the whole mounted upon the articulator in accordance with the usual methods pursued.—HART J. GOSLEE, *Dental Review*.

OBITUARY.

DR. JONATHAN TAFT.

DIED, suddenly, of apoplexy, at Ann Arbor, Michigan, October 5, 1903, in the eighty-fourth year of his age, JONATHAN TAFT, M.D., D.D.S.

Dr. Taft had been in good health, and just before sitting down to breakfast on the day of his death had expressed himself as "feeling very well indeed." He died a little after midnight.

Jonathan Taft was born September 17, 1820, in Russelville, Brown county, Ohio. His father, Lyman Taft, was a native of Massachusetts and came to Ohio in 1818. Dr. Taft was educated in the common schools and a small academy in Brown county, where he was a classmate of General U. S. Grant, and he taught school for four years. In 1841 he began the study of dentistry in the office of Dr. George D. Teter in Ripley, Ohio, and

began practicing for himself in 1843 in Ripley. In 1844 he located in Xenia, Ohio, and practiced there until 1858. He graduated from the Ohio College of Dental Surgery in 1850, and in 1854 was appointed professor of dental surgery in the same institution and occupied that chair until 1879, when he resigned because he had accepted a similar position in the University of Michigan. While connected with the Ohio College he was dean for the larger part of the time.

In 1856 he began editorial work on the *Dental Register*, a monthly periodical, one of the oldest dental journals in the United States. This position he held until January 1900. In 1857 he moved to Cincinnati and established a fine practice, which he relinquished in the summer of 1901, when he moved to Ann Arbor. In 1859 he wrote a text-book on Operative Dentistry, which for many years was the standard work on this subject.

In 1875 he was invited to organize the dental department of the University of Michigan, and accepted the professorship of principles and practice of operative dentistry. The first session was held the winter of 1875 and 1876. He was made dean of the department, which he established on the highest educational basis known at that time, and he has ever since striven to keep its standard as much in advance of other institutions as the professional advancement would allow.

Dr. Taft was a member of every important organization for the advancement of his profession, and probably attended and participated in more dental conventions than any other man. He spent much of his time and means in efforts to advance the profession's interest through dental societies. He was probably the best-known man in his profession. Through his college work, his editorial work, and his general interest in professional affairs, he had much to do with advancing professional standards as well as attainments.

While as a scientific worker he was not distinguished by attainments such as those of some who devoted their energies entirely

to that branch, yet he always kept up with every advance made in the scientific as well as the technical departments of the profession and by his suggestions he gave inspiration and encouragement to many men who were laboring in those directions. He always stood for high professional ideals and rejoiced in any advancement in dental scientific or technical knowledge.

In his religious life he was a devoted member of the Congregational Church and occupied prominent places in the councils of that denomination of a national as well as local character. He was for twenty-five years superintendent of the Sunday-school of the Vine Street Congregational Church of Cincinnati, and for nearly as long assistant superintendent of the Bethel Sunday-school, a large mission school having an attendance of from two to three thousand children. He was registrar of the Miami Congregational Conference for nearly thirty years. He was greatly interested in all benevolent objects, and gave largely of his means and time to such calls. As a man he was beloved by all who came in contact with him.

While a man of the greatest will power, he was always kind and ready to make such concessions as would overcome trouble. In this respect he had remarkable control of his natural disposition, which was always aggressive and single-minded. To do what he thought was right was always uppermost in his mind, but he readily made such concessions as would seem for the welfare of those about him.

In 1842 Dr. Taft was married to Hannah Collins of Ripley, Ohio, who died in 1888, and in 1889 he married Miss Mary Sabine of Cincinnati, who survives him. Two sons, Dr. Wm. Taft of Brewster, N. Y., and Dr. Alphonse Taft of Cincinnati, and one daughter, Mrs. A. T. Edwards of Ann Arbor, by his first marriage, are now living.

Funeral services were held at the house, 805 E. Huron street, on Saturday, October 17th, and the remains were taken to Cincinnati for burial in Spring Grove cemetery on Sunday afternoon following.

SOCIETY NOTES AND ANNOUNCEMENTS.

UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

FOURTH INTERNATIONAL DENTAL CONGRESS.

August 29 to Sept. 3, 1904.

Committee of Organization Dental Congress.

H. J. BURKHART, Chairman.

E. C. KIRK, Secretary.

R. H. HOFHEINZ,	J. W. DAVID,
WM. CARR,	WM. CRENSHAW,
W. E. BOARDMAN,	DON M. GALLIE,
V. E. TURNER,	G. V. I. BROWN,
J. Y. CRAWFORD,	A. H. PECK,
M. F. FINLEY,	J. D. PATTERSON,
	B. L. THORPE.

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

- I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer.
- II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.
- III. Chemistry and Metallurgy. Chairman, J. D. Hodgen.
- IV. Hygiene, Prophylaxis, Therapeutics, Materia Medica, and Electro-therapeutics. Chairman, A. H. Peck.

DEPARTMENT B—APPLIED SCIENCE.

- V. Oral Surgery. Chairman, G. V. I. Brown.
- VI. Orthodontia. Chairman, E. H. Angle.

VII. Operative Dentistry. Chairman, C. N. Johnson.

VIII. Prosthesis. Chairman, C. R. Turner.

IX. Education, Nomenclature, Literature, and History. Chairman, Truman W. Brophy.

X. Legislation. Chairman, Wm. Carr.

COMMITTEES.

Following are the committees appointed:

Finance. Chairman, C. S. Butler.

Program. Chairman, A. H. Peck.

Exhibits. Chairman, D. M. Gallie.

Transportation. (To be appointed.)

Reception. Chairman, B. Holly Smith.

Registration. Chairman, B. L. Thorpe.

Printing and Publication. Chairman, W. E. Boardman.

Conference with State and Local Dental Societies. Chairman, J. A. Libbey.

Dental Legislation. Chairman, Wm. Carr.

Auditing. (Committee of Organization.)

Invitation. Chairman, L. G. Noel.

Membership. Chairman, J. D. Patterson.

Educational Methods. Chairman, T. W. Brophy.

Oral Surgery. Chairman, G. V. I. Brown.

Prosthetic Dentistry. Chairman, C. R. Turner.

Local Committee of Arrangements. (To be appointed.)

Essays. Chairman, Wilbur F. Litch.

History of Dentistry. Chairman, Wm. H. Trueman.

Nomenclature. Chairman, S. W. Foster.

Promotion of Appointment of Dental Surgeons in the Armies and Navies of the World. Chairman, Wms. Donnally.

Care of the Teeth of the Poor. Chairman, Thomas Fillebrown.

Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.

Prize Essays. Chairman, James Truman.

Oral Hygiene, Prophylaxis, Materia Medica, Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck.

Operative Dentistry. Chairman, C. N. Johnson.

Resolutions. Chairman, J. Y. Crawford.
 Clinics. Chairman, C. E. Bentley.
 Nominations. (To be appointed.)
 Local Reception Committee. Chairman,
 Wm. Conrad.
Ad interim. Chairman, G. V. I. Brown.

The officers of the Congress, president, vice-presidents, secretary, and treasurer, will be elected by the Congress at large at the time of the meeting, and will be nominated by the Nominating Committee.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,
 E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.
 DAVID R. FRANCIS, *President of Exposition*.

“F. D. I.” INTERNATIONAL DENTAL FEDERATION.

(*International Grouping of Dental Interests.*)

Circular to the Presidents of National Dental Societies.

OFFICE OF THE SECRETARY GENERAL,
 45 RUE DE LA TOUR D'AUVERGNE,
 PARIS, Sept. 18, 1903.

Dear Sir and Honored Confrère,—The International Dental Federation at its meeting held in Stockholm in August 1902, in accordance with the powers that had been conferred upon it, decided that the Fourth International Dental Congress be held at St. Louis, Missouri, in August 1904, at the time of the holding of the St. Louis Universal Exposition. The decision thus reached followed the receipt of invitations regularly addressed to the F. D. I. by the National Dental Association, the Odontological Society of St. Joseph, the National Association of Dental Examiners, The Odontographic Society of Missouri and Western Kansas, the Society of Dental Science of St. Louis, the Committee appointed by the Missouri State Dental Association, the Dental Society of St. Louis, the City of St. Louis, the Government of the State of Missouri, and the authorities of the Louisiana Purchase Exposition. This decision was confirmed at the session of the F. D. I. held in Madrid in April 1903.

The officers of the Executive Council of the F. D. I., in accord with the authorities of the Exposition and the Committee of Organization of the Congress, have determined the conditions under which the Federation will take part in the organization of said Congress, and we are now officially advised that the Fourth International Dental Congress will be held in the city of St. Louis in 1904, from August 29th to September 3d, inclusive.

The purpose of this circular is to inform you that the International Dental Federation has decided to lend its entire support to the organizers of the Fourth International Dental Congress, and, in view of assuring the perfect success of the Congress, we therefore request you to appeal to the several dental societies in your country to take part in the said Fourth International Dental Congress.

It seems unnecessary to call your attention

to the importance of all dental societies the world over being appropriately represented at this gathering, both scientifically and professionally. We think it, however, desirable to call attention to matters which the delegates of the different federations and national societies will be called upon to discuss with reference to the organization of the second term of the International Dental Federation—that which will be comprised, namely, in the period between the fourth and the fifth international dental congresses.

During the first working period of the F. D. I., comprised between the Third International Dental Congress held in Paris in 1900 and that of St. Louis to be held in 1904, the members of the Executive Council of the F. D. I. who were appointed in Paris by your representatives have fulfilled to the best of their abilities the mission with which they had been entrusted by the members of the Third International Dental Congress, of which you may have been able to judge from perusal of the printed transactions of its different meetings.

They have assured the holding of a Fourth International Dental Congress (resolution No. 13).

They have created an International Commission of Education, which presented a program of international dental education at the sessions held in London, Cambridge, Stockholm, and Madrid (resolution No. 16).

The International Commission of Dental Hygiene, organized at the Cambridge session, will at the St. Louis meeting complete the program of international dental hygiene to be recommended to the public authorities.

Other projects of interest to the evolution of dentistry—such, for instance, as the publication of an international dental review—are being carefully studied in view of future realization. Reports have been prepared and presented on the federation of schools; and other propositions are now under consideration, such as the creation of a universal nomenclature, and also of a code of ethics to be universally accepted. The execution of these projects will devolve upon our successors in the subsequent terms of the F. D. I.

It will be the duty of the delegates to the St. Louis Congress to ratify the constitution of the F. D. I., to introduce such amendments as may be necessary, to appoint the members that will represent the different countries in

the Executive Council, and to decide on the program of the second period of the F. D. I.

Appreciating the importance of the great international gathering to be held in St. Louis in August 1904, we are convinced that you will be able to induce the national dental association and the other dental societies of your country to take part in the Congress by sending delegates and by contributing scientific papers.

We request that this circular be published in all the dental journals of your country.

Please accept, dear sir and *confrère*, the assurances of our fraternal sentiments.

DR. CH. GODON, *President*,

DR. E. SAUVEZ, *Secretary General*.

FRATERNAL DENTAL SOCIETY OF ST. LOUIS.

THE following was unanimously adopted by the society September 8, 1903:

Whereas, The Fourth International Dental Congress, which is to meet in St. Louis, Mo., August 29 to September 3, 1904, under the auspices of the Louisiana Purchase Exposition, is to be the greatest event in the history of dentistry; and

Whereas, the Fraternal Dental Society of St. Louis is progressive and stands for the best in dentistry and its interests; therefore be it

RESOLVED, That the Fraternal Dental Society of St. Louis heartily indorses the Fourth International Dental Congress and as a society and as individuals tender it their aid and support.

W. L. WHIPPLE, *Pres. pro tem*.

E. E. HAVERSTICK, *Sec'y*.

FIRST DISTRICT (N. Y.) DENTAL SOCIETY.

THE First District Dental Society of the State of New York will hold a clinic and exhibit at the Grand Central Palace, Forty-third st. and Lexington avenue, New York city, on Tuesday, December 8, 1903, at 1.30 P.M.

The dental profession is cordially invited. There will be a large and interesting program, to which the committee would like to add the names of every ethical member of the profession who will be kind enough to participate.

Exhibitors desiring space kindly communicate.

The regular meeting of the society, to which have been invited the Second District Dental Society of New York and the Central Dental Association of Northern New Jersey, will be held in the evening at the Academy of Medicine, at 8 o'clock.

W. D. TRACY,
RALPH B. REITZ,
S. L. GOLDSMITH,
Ch'man Clin. Com.,
129 East 60th st., New York city.

OHIO STATE DENTAL SOCIETY.

THE thirty-eighth annual meeting of the Ohio State Dental Society will be held at the Great Southern Hotel, Columbus, Ohio, December 1, 2, and 3, 1903.

Visitors are always welcome.

S. D. RUGGLES, *Sec'y*, Portsmouth, Ohio.

INTERSTATE DENTAL FRATERNITY OF THE UNITED STATES AND CANADA.

At the annual meeting of the Interstate Dental Fraternity of the United States and Canada, held at Asheville, N. C., July 29, 1903, the following officers were elected for the ensuing year: R. M. Sanger, East Orange, N. J., national secretary; Charles A. Meeker, Newark, N. J., national treasurer. Vice-presidents—U. Richardson, Fayetteville (for Arkansas); H. P. Carleton, San Francisco (for California); James McManus, Hartford (for Connecticut); Emory C. Bryant, Washington (for D. of C.); Hart J. Goslee, Chicago (for Illinois); George E. Hunt, Indianapolis (for Indiana); George A. Esterly, Lawrence (for Kansas); Edward Kells, New Orleans (for Louisiana); B. Holly Smith, Baltimore (for Maryland); John F. Dowsley, Boston (for Massachusetts); Frank E. Moody, Minneapolis (for Minnesota); Burton Lee Thorpe, St. Louis (for Missouri); Charles S. Stockton, Newark (for New Jersey); F. C. Walker, Brooklyn (for New York); J. A. Gorman, Asheville (for North Carolina); Henry Barnes, Cleveland (for Ohio); I. N. Broomell, Philadelphia (for Pennsylvania); Dennis F. Keefe, Providence (for Rhode Island); H. L. Banzhaf, Milwaukee (for Wisconsin).

R. M. SANGER, *Sec'y*,
East Orange, N. J.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

It is earnestly requested that all the secretaries of the Boards of Examiners throughout the states and territories mail to the secretary all changes in their respective boards, and greatly oblige

CHAS. A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

OKLAHOMA BOARD OF DENTAL EXAMINERS.

THERE will be a meeting of the Oklahoma Board of Dental Examiners at Oklahoma City, on Tuesday and Wednesday, November 10 and 11, 1903, for the purpose of examining candidates for license.

A. C. HIXON, *Sec'y*, Guthrie, O. T.

WASHINGTON BOARD OF DENTAL EXAMINERS.

THE next regular semi-annual meeting of the Washington State Board of Dental Examiners will begin its session Wednesday, November 11, 1903, at 9 A.M., in the California Building, Tacoma, Wash.

GEO. W. STRYKER, *Sec'y*, Everett, Wash.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS.

THE next regular semi-annual meeting of the South Dakota State Board of Dental Examiners to examine applicants for license to practice in the state will be held in Vermillion, December 8, 9, 10, and 11, 1903, beginning at 8 o'clock P.M. Positively no candidates will be received for examination after the 8th. Only those who hold diplomas from reputable dental colleges, and those having had three years of actual practice in dentistry immediately preceding the examination are eligible to take the same.

Candidates must come prepared to do all kinds of fillings. They must also bring with them teeth and the necessary utensils for doing both bridge and vulcanite work.

The examination fee is ten dollars, and subsequently five dollars will be required if applicant is successful in passing the examination.

G. W. COLLINS, Vermillion, S. D.

OHIO BOARD OF DENTAL EXAMINERS.

THE Board of Dental Examiners of the State of Ohio will meet in Columbus, Ohio, November 24, 25, and 26, 1903, at Hotel Hartman, for the examination of candidates for certificates of registration.

Application should be filed with the Secretary by November 14th. For further particulars address

H. C. BROWN, *Sec'y*, 185 E. State st.

COLORADO BOARD OF DENTAL EXAMINERS.

THE next regular meeting of the Colorado State Board of Dental Examiners will be held at the Capitol, Denver, beginning Tuesday, December 1, 1903.

All applications for examination must be filed with the secretary before that date. Examinations are theoretical and practical, and applicants must be prepared to do such practical work as required.

For further particulars address

M. S. FRASER, *Sec'y*,
407 Mack Block, Denver, Colo.

DENTAL COMMISSIONERS OF CONNECTICUT.

THE Dental Commissioners of the state of Connecticut will meet at Hartford, on Wednesday, Thursday, and Friday, November 18, 19, 20, 1903, respectively, to examine applicants for license to practice dentistry, and for the transaction of any other proper business.

The practical examination in operative and prosthetic dentistry will be held Wednesday, November 18th, at 9 A.M., in Putnam Phalanx Armory, corner Haynes and Pearl streets. The written theoretic examination will be held Thursday and Friday, November 19th and 20th, at the Capitol.

All applicants should apply to the Recorder for proper blanks, and for the revised rules for conducting the examinations. Application blanks must be carefully filled in and sworn to, and with fee, twenty-five dollars, filed with the Recorder on or before November 10, 1903.

By direction of the Dental Commissioners.

J. TENNEY BARKER, *Recorder*,
Wallingford, Conn.

MARYLAND BOARD OF DENTAL EXAMINERS.

THE Maryland State Board of Dental Examiners will meet for examination of candidates on November 4 and 5, 1903, at the Baltimore College of Dental Surgery, Baltimore, at 9 A.M.

For application blanks and full particulars apply to

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

EXAMINATIONS will be conducted by the Board of Dental Examiners of Pennsylvania simultaneously in Philadelphia and Pittsburgh, December 15 to 18, 1903.

For application papers or any information, address

ISAAC B. BROWN, *Sec'y Dental Council*,
Harrisburg, Pa.

ARKANSAS BOARD OF DENTAL EXAMINERS.

THE next regular meeting of the Arkansas State Board of Dental Examiners will be held December 4 and 5, 1903, in Little Rock, Ark., for the examination of all applicants. Those having applied for examination will report to the secretary, Friday, December 4, at 9 A.M., with rubber dam, gold, plastic filling material and instruments, to demonstrate their skill in operative dentistry. Any who wish may bring their patients; so far as possible, patients will be furnished. The board will select the cavities to be filled. The examination will cover all branches of the dental profession. For further information write the secretary.

A. T. McMILLIN, *Sec'y*,
Fifth and Main sts., Little Rock, Ark.

HARTFORD DENTAL SOCIETY.

AT the annual meeting of the Hartford Dental Society, held October 12, 1903, the following officers were elected: Edward Eberle, president; Albert W. Cowee, vice-president; A. E. Cary, secretary; Ernest R. Whitford, treasurer; Wm. A. Damon, librarian; Nelson J. Goodwin, historian. Executive Committee—C. E. Barrett, chairman; F. Dewey Clark, C. C. Prentiss.

ALBERT E. CARY, *Sec'y*,
53 Trumbull st., Hartford, Conn.

AMERICAN SOCIETY OF ORTHODONTISTS.

CHANGE OF DATE OF MEETING.

THE third annual meeting of the American Society of Orthodontists will be held on December 31, 1903, and January 1 and 2, 1904, in Buffalo, N. Y.

The meeting will be held at the Iroquois Hotel, Buffalo. A most interesting program has been prepared.

ANNA HOPKINS, *Sec'y*, St. Louis, Mo.

INSTITUTE OF DENTAL PEDAGOGICS.

THE eleventh annual meeting of the Institute of Dental Pedagogics will be held in Buffalo, December 28, 29, and 30, 1903, at the Iroquois Hotel. All interested in education and the elevation of the standards of the dental colleges and students are very earnestly requested to be present at this meeting. The following program has been arranged:

1. President's address, "Some Faults of the Prevailing Dental Training." J. D. Patterson, Kansas City. Discussion by John I. Hart, New York, B. Holly Smith, Baltimore, H. P. Carleton, San Francisco, Geo. E. Hunt, Indianapolis.

2. "Prosthesis." (a) "Methods of Teaching the Artistic Elements of Prosthetic Dentistry." A. O. Hunt, Omaha, Neb. (b) "Methods of Teaching the Anatomical Ar-

rangement of Teeth." B. J. Cigrand, Chicago. Discussion by N. S. Hoff, Ann Arbor, G. H. Wilson, Cleveland, R. R. Freeman, Nashville, F. H. Berry, Milwaukee.

3. "An Ideal in Pathology." D. R. Stubblefield, Nashville. Discussion by H. A. Smith, Cincinnati, T. B. Hartzell, Minneapolis, A. H. Peck, Chicago, O. L. Hertig, Pittsburg.

4. "Orthodontia Technology." S. H. Guilford, Philadelphia; C. S. Case, Chicago. Discussion by W. E. Grant, Louisville, A. E. Webster, Toronto, H. B. Pullen, Buffalo, H. T. Smith, Cincinnati.

5. "The Value of Instruction in Dental History and Literature." J. Taft, Ann Arbor. Discussion by H. L. Ambler, Cleveland, Chas. McManus, Hartford, J. H. Kennerly, St. Louis, B. J. Cigrand, Chicago.

6. "Porcelain Technology." H. J. Goslee, Chicago. Discussion by J. Q. Byram, Indianapolis, Ambler Tees, Philadelphia, L. E. Custer, Dayton, H. L. Banzhaf, Milwaukee, J. F. Ross, Toronto.

7. "The Dental Curriculum." Geo. E. Hunt, Indianapolis. Discussion by G. V. Black, Chicago, J. B. Willmott, Toronto.

8. "How Shall Quizzes be Conducted?" Symposium: F. D. Weisse, New York, R. H. Nones, Philadelphia, L. P. Bethel, Kent, Ohio.

9. "Exhibition of Recent Teaching Appliances." W. G. Foster, Baltimore; L. S. Tenney, Chicago.

W. H. WHITSLAR, *Ch'man Ex. Com.*

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING SEPTEMBER 1903.

September 1.

No. 737,616, to HARDY B. HARRELL. Dental instrument.

September 8.

No. 738,152, to EDWIN BETTS. Dentist's tool for crimping edges of metal crowns.

No. 738,517, to ROY K. BELDEN. Method of filling teeth with porcelain.

September 15.

No. 738,929, to ANDREW McMILLIN. Dental instrument.

September 22.

No. 739,333, to WILLIAM J. MILES, Jr. Dental instrument.

No. 739,764, to JOHN C. HOLSON. Dental spraying apparatus.

September 29.

No. 739,980, to CHARLES F. BRYANT. Educational appliance for dental students.

No. 740,096, to CHARLES A. DAVIS. Fastening device for artificial teeth.

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ORIGINAL COMMUNICATIONS.

TROPICAL INFLUENCE ON THE DISEASES OF THE ORAL AND DENTAL TISSUES.

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(Read before the Manila Medical Society, September 7, 1903.)

IN studying the abnormal manifestations of the oral and dental tissues in a tropical or subtropical climate, or in oriental countries, I find that neither the periodical nor the permanent literature contains any data on the subject, although the manifestations of certain systemic diseases which affect the mucous membrane or the gums have been noted by medical authorities for many years. The absence of any mention of these conditions, from a dental standpoint, is worthy of note for several reasons, and I think may be accounted for.

In the first place, the scientific study of tropical diseases from a medical standpoint is of comparatively modern origin, most of the observations along these lines simply extending back to about 1880. It is true that prior to that time such diseases as leprosy, plague, cholera, etc., which strictly speaking are not *per se* tropical diseases, have been studied for hundreds of years, yet the study of some diseases said to be inherent in warm climates, or at least to present abnormal

manifestations in warm climates—such as amoebic and tropical dysentery (sprue)—is of more modern origin; and it would naturally follow that diseases of the mouth, and especially of the teeth, the study and knowledge of whose pathology is practically entirely modern, can hardly have received much attention.

Secondly, it is well known that dentistry has made the greatest progress in the United States, and that dentists from that country have been for years established in most of the large cities in the Orient, and in tropical and subtropical climates; yet no practical notice has been taken by these practitioners of the modifying influence of warm climates—or at least their observations have not found their way into our literature.

I account for this on the following hypothesis: Almost without exception, American dentists who go abroad to engage in the practice of their profession are young men who have been well educated, are capable and perfectly competent, but who lack the experience neces-

sary to differentiate and compare, especially pathological conditions, albeit they practice successfully without realizing the fact that the conditions under which they labor differ from those of practitioners in the temperate zones. Of the dentists of other nationalities it may be said that they have neither located in any numbers in the tropics nor were they as a rule equipped by previous training for the observation of climatically affected abnormal conditions. Indeed, until comparatively recently, large numbers of the white race have not made their homes in the tropics. Native dentists, such as those of Japan, the Philippines, China, India, etc., by the nature of the circumstances under which they acquired their knowledge, were not in a position to note the varying pathological manifestations.

The most extensive observations were made by medical men connected with the universities of India and Japan, and by surgeons connected with the armies and navies of various nations whose soldiers and sailors were often placed very suddenly under extraordinary conditions, and thus presented in disease abnormal symptoms which were properly attributed, in a large measure, to other causes than tropical influence, as will be noted hereafter. As regards our own troops in the Philippines, my attention first turned to these conditions while practicing in Japan in 1899, when the first volunteers returned to the homeland after a residence of about one year in the tropics under excessively injurious conditions, and after an insufficient time to be affected in a manner which appears abnormal but which is in reality normal, among people living in and accustomed to tropical or subtropical climates. On locating in Manila I had further opportunities for observing these abnormal conditions, and to report on the same in a paper entitled "Observations on the Practice of Dentistry in the Philippines," read before the Manila Dental Society on March 12, 1900. On the arrival of the dental corps of the United States army in the fall of 1901, I called the attention of Dr. Oliver, the supervis-

ing dental surgeon of the corps, to the importance of observations along these lines, the effects of "buyo" chewing, etc., and a suggestion was incorporated in a circular letter issued by him at that time to the members of the dental corps. With the extensive opportunities for observation offered to the dentists of the army, I am anxiously looking forward to some report on this topic.

In the consideration of the subject I shall divide it into two sections: (1) Tropical influence on the oral and dental tissues of *indigenous races*, including in this group all whose habits of life, as to clothing, food, mode of living, hereditary influence of tropical life, etc., are alike or nearly so. (2) The same influence as noted in *races not indigenous*—which practically embraces the Caucasian or white race whose members have transplanted themselves into extraordinary conditions and must pass through the process of acclimatization, with its attendant systemic changes. The latter, in turn, may be divided into two classes—(a) those who are resident but for a short time and are not acclimated, and many of whom violate even the most ordinary hygienic precautions which should be observed in any country or climate (to this class belong in large numbers the troops of various nations), and (b) those who by long residence in the tropics have become acclimated and inured and whose systems have normally passed into a tolerant condition.

In both of these classes I am inclined to consider, with what may be termed the tropical and subtropical influence, an "oriental influence," for some of my observations made in Manila have their counterpart in conditions I observed in Yokohama (which is practically in a temperate climate) while in practice there five years ago; hence I am of the opinion that there are certain influences operative in the East in climates not tropical or subtropical, yet identical with those affecting the latter. I am unable to say whether similar conditions prevail in the Straits, India, Africa, and other orientally or semi-orientally influenced sections.

I. TROPICAL INFLUENCE ON THE ORAL AND DENTAL TISSUES OF INDIGENOUS RACES.

(A) *The Soft Tissues.*

In specimens belonging to the Malay or Mongolian race, as among those belonging to the Ethiopian, the first noticeable feature of the soft tissues—that is, of the mucous membrane and gums, especially of the latter—is the pigmentation; in a less marked degree, however, than among Ethiopians, and with a reduced activity of the mucous as well as of the salivary glands, probably due to the use of tobacco, which, especially among Malays, is resorted to by both sexes and is commenced at an early age. The various affections to which these tissues are liable are usually less distinct, and under treatment the prognosis is more favorable.

The local manifestations of syphilis, mercurialism, etc., offer no different aspect. There is only one condition—which fortunately in the ordinary practice of dentistry would not present itself clinically—and that is the presence of leprous patches in lepers. The disease of leprosy is fortunately practically extinct in many of the countries of the Occident, while in others it is under absolute control as a result of rigid isolation.

In October 1899 I examined the lepers confined at the Meguro Leper Hospital,¹⁶ near Tokio, Japan, but as I did not examine the cases in the most advanced stages, and confined the examination more particularly to the condition of the teeth, which presented nothing unusual, I did not see any of the leprous patches. But last month, by permission of the attending surgeon of the San Lazaro Leper Hospital, in this city, I examined the mouths of sixty-five of the two hundred and one inmates, the cases ranging from children five years of age, in whom the symptoms of leprosy had barely manifested themselves, up to and including all ages and stages of the disease, and especially those in the most advanced stages, some of whom, while “retaining intellect, were

devoid of some of the senses, presenting more repulsive pictures than imagination can conceive.”

I noticed that even in the cases where the tubercles had broken down around the circumference of the lips, the resultant ulceration involving the entire orifice of the mouth, the ulceration was usually well defined, stopping short at the point where the integument becomes continuous with the mucous lining of the mouth. This fact is especially noticeable when it is remembered that many authors, among them Scheube²¹ and Manson,¹¹ consider the mucous membrane of the nasal passages one of the principal seats of infection. In the most advanced stages, however, the leprous patches were well defined, in some of them involving a considerable area of the surface of the mucous membrane.

(B) *The Teeth.*

There are no comparative statistics of the condition of the teeth of any race, and statements made that the teeth of any nation or race as compared with the teeth of another nation or race are of better or poorer structure must, by their nature, be based upon cursory observation. Such examinations as have been made date back to 1867, when Magitôt¹⁰ presented his charts on the basis of investigations carried on during recruitments in France, when men of certain ages only were examined. Duché in 1869 also reported on similar examinations, while in England, Cunningham⁶ made similar reports. In other instances such examinations were confined to the inmates of eleemosynary institutions, or to hospitals for the deaf, dumb, blind, and insane, or to persons exposed to specially deleterious influences, such as bakers, match-factory employees, etc. Mummery's¹⁵ observations in reference to the Gauchos in the pampas of South America and the Indian tribes of Chili, as well as Andrieu's among the residents of Paris, are general in their nature and cannot be used for purposes of comparison.

Satisfactory information in this direction has only been obtained as the

result of the examination of the teeth at certain ages, usually school-children. In the examination and tabulation of their condition considerable progress has been made, and we have reliable data from which to make deductions. My own work along these lines extends back to 1882, when a report¹⁷ was made on 355 children, covering the examination of 8239 teeth, which was subsequently (in 1886)¹⁸ extended to cover a total of 623 children and 14,644 teeth. Parreidt¹⁹ reports on 13,000 teeth, Röse²⁰ on 7364 children, covering 179,087 teeth, Pedley on 3145 children and about 70,000 teeth, while Unghvári²⁴ reported on 23,900 teeth, Berten¹ on 3347 children, Fenchel¹⁷ on 323 children, and finally Voerckel and Weber²⁵ on 5003 children and 114,865 teeth. These statistical tables give the condition of the teeth in school-children in the United States, Germany, Great Britain, France, and Austro-Hungary, but there have also others been made in Switzerland, Sweden, Norway, Belgium, and in fact in nearly all countries populated by the Caucasian race.

As previously stated, no examinations or tabulations of the teeth of any nation or people having ever been made—that is, by taking definite numbers of persons of all ages and conditions, and then comparing them with a similar number of other nations or races—no one can with any degree of accuracy say whether the teeth of the Malay or Mongolian race are of better or poorer structure than the teeth of the Caucasian.

I am unaware of any reports, such as are mentioned above from the United States and Europe, coming from any other race. Last, year, by permission of Professor Atkinson, the insular superintendent of public instruction, I examined the teeth of 250 Filipino boys, 250 Filipino girls and 50 Chinese boys in the public schools of this city, and when the tables and charts of these examinations are completed it will present the first opportunity to make comparisons between the condition of the teeth of one branch of the Malay race and the Caucasian. The fifty Chinese boys and the report on them cannot be considered

conclusive, for it is well known that but few Chinese women live in Manila and the fifty boys examined seemed to be splendid specimens of the race, and not at all representative. The figures may be considered only in the light of local influence or the social status of the parents of these children. The teeth of these fifty boys were, in structure, better than those reported upon by any writer of whose report I have any knowledge.

Approximately the number of teeth examined by me in the mouths of the 500 Filipino children is over 12,000, which is a sufficiently representative number for purposes of comparison. As this subject is an extensive one, and the material collected is intended for another paper, it may be said in passing that the teeth of the Filipino school-children do not materially differ in structure from the teeth of American, German, French, British, Swedish, or other school-children of the Caucasian race.

I am inclined to the view that among these people, as well as among the Japanese, in later life there is a modification for the better, and without being able to definitely substantiate the statement, I feel warranted in saying that as a whole the teeth of the adult Filipino are better than the teeth of the same classes of white persons under the same conditions, *i.e.* the almost total absence of care for them; for the Philippine Islands are practically devoid of dentists, excepting the few located in Manila. It is impossible in this paper to consider the reasons for this, but I believe it in a large measure to be due to the habit of smoking to which both sexes are addicted, and the fact that the habit is acquired at an early age, while the unexplained influence of nicotine during the formative period of the tooth-structure has the best opportunity to exert itself. The proneness to caries, which in Caucasians gradually diminishes until the twenty-fifth year, is considerably retarded in the children of these people by the sixteenth or eighteenth year. Betel-nut chewing also exerts an influence, in part beneficial, in part deleterious, on which there is no time at present to elaborate.

Without, therefore, going into details at this time, it is safe to assert that, taking into consideration conditions other than climatic influences, the teeth of children of school age do not materially differ from the teeth of the children of the white race, while the teeth of adults, as a whole, are better for the reasons stated.

Caries, odontalgia, diseases of the pulp, alveolar abscess, pyorrhea alveolaris, and other dental affections exhibit no differential symptoms, except in minor details as hereinafter noted.

Externally, attrition of the teeth is more pronounced, due to the chewing of betel, the latter also causing discoloration, which extends into fissures in the enamel and into the substance of the teeth. Erosion, due to systemic or glandular derangements, is perhaps less frequent than in the more highly organized individuals of the white race, but the betel nut causes an erosion, by the direct action of the buyo leaf, areca nut, and lime, which for the want of any designation I term *erosio areca*, or betel erosion, also a subject for a future report.

Before passing from the consideration of the natives and their teeth, it may not be out of place to call attention to their inordinate desire for decoration, which finds expression in fastening so-called "dental ornaments," made by dentists or jewelers, between the interstices of the anterior teeth, and in requests for gold crowns, caps, and other gaudy gold work. While the fair sex displays the most vanity in this direction, it is also fair to state that a small percentage of the more intelligent and better educated natives show the same abhorrence to the display of artificiality as the better and more highly cultured class of the white race.

II. TROPICAL INFLUENCE ON THE ORAL AND DENTAL TISSUES OF RACES NOT INDIGENOUS.

(a) THE UNACCLIMATED.

The migration of members of the white race into climates to which they are apparently unsuited, and not by

heredity inured, has opened up for medical science the study of the influences operating during the process of acclimatization, and the study of the conditions which modify the constitution of individuals in order to submit to the new environment. The failure to recognize these conditions sometimes leads to the embarrassment of the dental as well as the medical practitioner. It has been shown by Spencer²⁷ that "Every organ and every function of living beings undergoes modification to a limited extent under the stimulus of any new conditions, and that the modification is almost always such as to produce an adaptation to those conditions." Darwin²⁶ also holds the same views. The principal obstacle in the case of the white man, especially if he comes from the colder climates of the temperate zones, lies in his active and nervous constitution, which does not readily permit him to accommodate himself to the altered conditions under which he labors. This has been exemplified in instances too numerous to mention among Americans in these islands, many of whom, barring the constitutionally weak, through excessive activity or immoderation have been either prostrated by illness or carried to the grave. In speaking of the tropics, it is well to remember that the temperature is not uniformly high in all tropical countries, but that the tropics offer a variety of climates, by reason of geographical and meteorological influences, by the altitude, ocean currents, rainfall, distance from the sea, etc. Yet the sudden transplantation of man from a cold or cool climate into even the most favorably affected sections of the tropics results in changes within him which, while operating, affect the entire system. Thus the body temperature, the most uniform of the functions of the body, regardless of climate, may be normally slightly higher in a tropical or subtropical climate, while during physical disturbances a temperature of 105° F., which portends anxiety in a temperate climate, is not necessarily so viewed in the tropics; likewise changes take place in the entire alimentary tract and its appendages, cer-

tain fungi, such as *Oidium albicans*, in temperate zones considered a fungus of grave possibilities, are often present under normal conditions in the mouths of persons in good health, and in the most ordinary inflammations of the mucous membrane. The hyperhidrosis superinduced by a constantly high temperature exposes the integument directly to disease, and indirectly, by creating an atonic condition of the kidneys, elevates the specific gravity of the urine, and interferes with the elimination of products of metabolism usually secreted by them.

When these facts are borne in mind it will be recognized that the individual new to the tropics is extremely susceptible to derangement—a fact which leads those who have never lived in the tropics, or who have been there but for a short time, to view the situation with considerable alarm, and to look upon physical or oral manifestations as abnormal and peculiar to the tropics, whereas identical results appear under certain conditions without entering the tropics at all. This is especially true in regard to troops not acclimated. In considering the effects of the influence of the tropics on troops the investigations made by Bergeron, Taupin, and Barthez and Rilliet were conclusive on the point that a number of the mouth affections were wholly due to unhygienic and unsanitary barracks or quarters, and carelessness on the part of the men—in fact, were the result of abuses which in any climate could have no other result. The very fact, as stated by Forchheimer,⁸ that officers in proportion to the enlisted men were almost exempt from the various diseases of the mouth from which the men suffered, indicates that the condition could not be attributed to the tropics. The officers are not huddled together in barracks, enjoy greater freedom, are careful of food and water even under the most trying conditions; these and other similar reasons make them almost immune from attacks of a certain class of affections of the mouth. It would be as idle to claim to find anything abnormal in the mouth of an unacclimated soldier or civilian in the Philippine Islands, for instance, as

to claim that the death-rate from cholera among the troops during the last two years was normal. The fact is, that hardly a soldier would have succumbed to cholera had he followed the directions and rules as to food and water laid down by the competent medical corps of the army. In nearly every instance the infection was traced to the use of contaminated water, or the eating of food or fruit (most of it prohibited) purchased from irresponsible and often dirty native vendors.

It has been my fortune to see from a dental viewpoint, during the last five years, in the neighborhood of 3000 enlisted men and some 400 officers, and the conditions of disease in the mouths of the two classes are so disproportionate as to show that the abnormal conditions noted in the enlisted men were due to the processes of acclimatization rather than to any definite tropical influence. In fact, these conditions are identical with those found in any climate where large numbers of persons are housed together, as in unsanitary hospitals, tenement houses, etc.

I can find only one reference to anything that may seem abnormal; at least it is wholly unfamiliar to me. Scheube,²¹ in treating of tropical aphthæ or sprue, ascribes to Crombie⁵ the following statement: "Very often, and frequently before the tongue has become affected, there may be observed a small sore, between the last two molar teeth, above and below, on both sides," which is known in British India under the name of "Crombie's molar ulcer." I have been unable to secure Crombie's article on this subject. The definite statement he makes regarding the location of this ulcer would place it invariably between the second and third molars, and as the latter teeth in a large number of cases never erupt and in many others only one, two, or three of the four will erupt, its location must be variable and cannot always be between the second and third molars. Had the statement been made that the ulcer was present between the first and second molars, the proposition would be a totally different one, for it is very rare,

extremely rare, for either of these to fail to erupt.

Before passing this part of the subject, it may be added that I have had the opportunity to observe the condition of the mouths of the enlisted men, from the splendid grade of American citizens who came from the militia organizations of the various states and those who formed the first volunteers, also those of the subsequent enlistment, composed of men prompted by a mingling of patriotism and adventure, down through the entire range of men, among them a few who, after a debauch and dissipation, walking penniless the streets of a large city, were attracted as a last resort to the recruiting station. I have not found, aside from the effects of the processes of acclimatization, illness, hardships or deprivation, all of which may show manifestations of disease in the mouth, any condition that would seem to be abnormal, and not readily traced to its origin.

In reference to the presence of bacteria, it may be stated that of the twenty-five or thirty varieties which have been described by Miller,¹⁴ Black,² and others, and which have their temporary or permanent habitat in the mouth (with the possible exception of *Saccharomyces albicans*, formerly known as *Oidium albicans*, and which in temperate climates is not found under normal conditions), the usual specimens of the streptococcus variety, the various forms of bacilli, and the leptothrix are present in greater number.

The Soft Tissues.

It being generally accepted that certain processes of acclimatization must take place until a suddenly transplanted white person is inured to the tropics, consonantly the general etiology and prognosis of the diseases affecting the soft tissues of the mouth present some differentiation from what is observed in those inured by long residence or those who have passed through an intermediary stage by living in a section of a tropical country which for meteorological reasons presents less extremes of high temperature.

In the first stages of the process of acclimatization the mucous membrane loses a measure of buoyancy, the capillaries of the submucosa lose somewhat in elasticity, and the result is that more or less turgidity of the mucous membrane and the gums takes place, with a tendency of the free margin of the gum and the festoons to fall away from the necks and the interstices of the teeth, and thus form pockets for the lodgment of extraneous matter, which in the uncleanly leads to a greater or less degree of ulitis, inviting infection. Even in the cleanly, some loss of elasticity of the tissues is noticeable. The gums, though supplied with a rich plexus of bloodvessels and nerves, are in health devoid of much sensibility, and, not unlike as in temperate climates, in the presence of the ulitis they become hypersensitive, and this condition may persist until the individual is fully acclimated.

It therefore naturally follows that all inflammatory conditions affecting the mucous membrane and the gingivæ are more aggravated, and do not yield quite so readily to ordinary treatment. In specially marked cases of this form of stomatitis, when persistent, I have found free scarification, followed by an application of iodine paint (saturated solution of crystals of iodine in absolute alcohol) yield good results. In those persons who become readily acclimated without much disturbance of the alimentary tract, or who do not fall victims to one or other of the exanthemata, the soft tissues within a few years regain their normal condition and perform their functions in the usual manner, albeit they remain always more susceptible to disease.

The theory of the uric acid diathesis as a predisposing cause of pyorrhea alveolaris, it would seem, receives some support from the fact that this disease, in persons who are affected by it when they reach the tropics, becomes aggravated, possibly from the atonic condition of the kidneys, which in turn is superinduced by the more extensive function of the skin. These cases do not yield to treatment readily and often require the application of the more caustic of the

remedies in use for the treatment of this disease. I have found the best results to follow the application of the crystals—or rather, the only form in which we can keep it in this climate, which is a thick, viscid fluid—of zinc chlorid.

I have been unable to find described in any work relating to tropical diseases, or elsewhere, a form of stomatitis which for want of a descriptive term may be designated as “tropical ulcerative stomatitis” (*Stomatitis ulcerativa tropica*). It presents sufficient clinical differences not to be the simple ulcerative form, nor to come under any other classification of stomatitis, the symptoms warranting a tropical influence. While this condition may be observed occasionally among those who have been fully acclimated, it is found principally during the progress of acclimatization. It generally follows either the general depression and systemic disturbances which are manifested in many soon after their arrival in the tropics (hence I saw many cases among the early volunteers in the islands), and always in those who do not readily adapt themselves to the new conditions or who are compelled to deprive themselves of the usual comforts, as in the provinces, or who are attacked by fevers or disturbances of the alimentary canal; indeed, in most cases of the exanthemata they are followed by a more or less pronounced case of this form of stomatitis. In sixty-seven out of eighty-three cases, the only one of which I have kept any record, inquiry revealed the fact that the patient had suffered from malarial fever, dysentery, aphthæ (sprue), or some other disease which had drained the system of vitality.

I have rarely seen it in individuals who have arrived in the tropics but recently. A month ago, in the case of a German, a marked specimen had developed, although he had arrived here but six months previously. I learned from his history, however, that he had been ill at home suffering from some kind of fever, and in fact secured the assignment out here with the idea that the change would do him good.

The fact that comparatively so few

cases occur among the officers of the army and navy and the better class of civilians, and that it is practically absent among sailors, yet prevalent among members of the marine corps, points to the supposition that there must be some predisposing cause affecting those living closely together, at stations or in the field. Whatever this predisposing cause may be, in a temperate climate it would perhaps lead to a simple ulitis or catarrhal stomatitis, while here it assumes the ulcerative form. There is in favor of the latter condition the fact that it yields more readily in this climate than in the temperate. In other words, while typical cases of ulcerative stomatitis of the tropical form will develop in this climate as a result of less systemic disturbances than when it follows diseases in temperate climates, it also yields more readily to treatment.

It is needless to go into the consideration of the usual form of stomatitis which is associated with or succeeds aphthæ, thrush, and other similar conditions, as they have been fully described by various authorities (see the works numbered 3, 4, 8, 9, 11, 12, 13, 21, 22, and 23 in the bibliographical list appended to this paper).

In the tropical ulcerative form the attack on the margin of the gums is general, it will involve the labial, buccal, and lingual surfaces indiscriminately, and is not confined to any one locality, either above or below, as is the usual case with simple ulcerative stomatitis. The free margin of the gum and the festoons suppurate, emit an offensive odor, and in falling away from the teeth expose their necks. The patient usually seeks advice by reason of the painful condition of the gums and teeth, which materially interferes with mastication. The teeth are loosened, and the gums if injured bleed freely; the tongue is coated, and the body temperature is above normal. The patient suffers from a general depression.

In the treatment, all predisposing causes must at once be removed. If the home be unsanitary, that condition should be remedied, or what is better, removal to other quarters effected; if the food be

unwholesome, as is often the case with native or Spanish cooking, the diet must be changed. If possible, smoking and the use of spirituous liquors should be suppressed, or at least modified. Internally, the use of potassium iodid in doses of from 2 to 10 grains, the administration of quinin, wine of beef and iron, etc., are indicated.

Locally, at the first sitting, all the teeth should be thoroughly cleansed of calculus and other foreign matter, this to be followed by a removal of the diseased and partially destroyed tissue with a rapidly revolving brush wheel in the dental engine, and encouraging the bleeding thus resulting by the use of warm water as a gargle. After the bleeding has somewhat subsided, the entire affected parts are touched with zinc chlorid. This suffices for the first treatment. The patient is then supplied with —

Gargarisma potassæ chloratis.

R—Potassæ chloratis, ℥j;
Aquæ destillatæ, ℥xx. Misce.

Sig.—To be used as a gargle frequently during the day.

At the subsequent sitting a further cleansing follows, in order to remove particles which on account of the profuse bleeding at the first sitting could not be removed. The affected parts are then touched with the mixture known as "Black's 1, 2, 3," composed of one part of the oil of cinnamon, two parts of carbolic acid, and three parts of oil of gaultheria. This is followed by a complete painting of all the affected parts with the iodine paint previously mentioned. It is seldom necessary to repeat this heroic treatment. Considerable discomfort and soreness supervenes, but an immediate improvement will be noticed. If the potassium chlorid gargle be persisted in, together with the other systemic treatment mentioned, only an occasional application of the iodine paint need be resorted to, and the disease will subside in from eight to ten days. When it is possible, a change to a cooler climate will aid materially. I have found much improvement to take place from a short

trip to Hongkong, while a trip to even Nagasaki only, restores complete health.

The Teeth.

As a general rule with newly transplanted white persons, the first thing noticed by them as relates to the teeth is a proneness to more rapid caries. The following question is more frequently put than omitted: "Why do the teeth decay so rapidly in the tropics?" My observation is that, *per se*, this is not a fact. It is true that in so far as the general system suffers the teeth form no exception. I have been confronted with similar questions modified by the geographical locations I am about to name. From 1879 to 1882 I practiced in Southern Illinois, near St. Louis, in a community made up almost wholly of Germans of a good stock. The newcomers among them were invariably of the belief that emigration to the United States destroyed their teeth. From 1882 to 1884 I practiced in North Dakota, where I have seen the temperature fall to 52° F. below zero, and the community was made up of recently arrived Scandinavians, and some of the best element of the eastern and middle western states, even from the South as far as Alabama, to be confronted with the same inquiry—that is, why in coming to a cold climate the teeth should at once become veritable wrecks. For the first five years of my practice in Chicago I had a large *clientèle* among Germans and Scandinavians, only to find the same views prevailing. All these people were unmindful of the fact that among them were some who had reached middle life or passed it before leaving their native lands, and the condition of whose mouths was not different from that of the mouths of people of the same age who never migrated from the locality where they were born in the United States. I am of like opinion in regard to what I have seen in something like 5000 mouths in the Philippines. Those who have been accustomed to dental care possibly require at first a little closer attention, while in the mouths of those who have never received dental care

the cumulative effects of destruction are perhaps somewhat hastened. On the whole, life either in the Orient or the tropics exerts no baneful influence upon tooth-structure or the progress of caries.

So far as the affections of the pulp under abnormal conditions are concerned there is a material difference. The nerve filaments of the pulp are at first hypersensitive, and the pulp once affected is hopeless of salvation. Neuralgic pains from slight causes are more frequent and obscure, indeed many of them are relieved by systemic remedies alone.

In abscessed conditions the treatment must be more persistent and absolutely thorough to prevent recurrence. It should also be borne in mind that wounds within as well as without the mouth do not readily heal, and in the mouth it is almost impossible to prevent some supuration from taking place following extraction. Even with perfectly nickle-plated forceps, absolutely clean, having been sterilized by myself, not depending on an assistant, I have found infection follow. It is my custom to apply a 1:1000 solution of mercury bichlorid to the socket, with favorable effect.

The use of local anesthetics is wholly contra-indicated. I have seen a number of serious and painful results from its use, leading often to the destruction of considerable tissue, and in some instances exfoliation of portions of the alveolar process. During the first year of my practice in Manila, I used injections of cocain, securing reliable beta-eucain hydrochlorate, and other ingredients and distilled water reliably pure, preparing the injection in a sterilized vessel fresh at the time of using, employing a platinum needle previously passed through heat; and yet I found such unfavorable results that I have entirely abandoned the use of local anesthetics, and from the reduced number of cases I now see from the hands of my *confrères* I am inclined to believe that by them also its use has been abandoned.

(b) THE ACCLIMATED.

Hard and soft tissues. After a transplanted person remains in the tropics for

a period of from two to three years, and has retained good health, the process of acclimatization is virtually completed—if in that particular individual it ever can be—and the person is inured. The complete acclimatization and the length of time required for it, of course, varies in different individuals and under varying conditions. The soft tissues of the mouth then acquire a tone consonant with the new surroundings and the altered conditions of the system. The practice of dentistry henceforth differs only in a few minor details from orthodox principles.

The soft tissues, the mucous membrane and gums, are more susceptible to disease, yield more slowly to treatment, and injuries of them heal somewhat sluggishly. This is also true of wounds produced by extraction, the diseases of the pulp, the treatment of pyorrhea, etc. The progress of caries under the ordinary hygienic conditions is not abnormal.

I have been prompted to outline these observations for the reason that at the present time there are no data to guide a practitioner of dentistry in oriental or tropical countries, and as the result of a conviction that certain modifying conditions do exist, an understanding of which cannot be otherwise than helpful to the intelligent practitioner.

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ANATOMICAL LANDMARKS OF SPECIAL INTEREST TO THE DENTAL AND ORAL SURGEON.

By TRUMAN W. BROPHY, M.D., D.D.S., Chicago, Ill.

(Read before the Section on Odontology and Stomatology, Fourteenth International Congress of Medicine, Madrid, April 23, 1903.)

THE anatomical landmarks of the oral cavity have not received attention in a practical way such as their importance demands. Every dentist, almost daily, necessarily deals with them, and should therefore keep in mind their relation to the operations which he is called upon to perform.

The superior maxilla. Conspicuously to be observed in the superior maxillary bone may be seen the malar process. By continuity it reinforces the alveolar processes, thus fixing the upper first molar more firmly in its alveolus than any of its fellows, and consequently making the removal of its roots more difficult. It serves as a guide in the performance of operations for the removal of tumors and cysts, opening and treating the antrum, etc. The canine fossa practically has many interesting points to be considered. When the full complement of teeth is present and it becomes necessary to open the antrum in the treatment of empyema of that cavity, our attention is called to

the fossa as the most accessible point of entrance. Having made an incision through the muco-periosteum transversely across the fossa and denuded the bone, we may by the use of the spear-shaped drill operated by the dental engine penetrate the thin anterior wall of the antrum, and afterward with a double-cutting bur enlarge the opening to the size desired to enable us to remove polypi, carious bone, foreign substances, etc., as conditions require.

Through the admirable work done in facial and cranial anatomy by my distinguished fellow countryman, Dr. M. H. Cryer, we have learned of many anomalies of the bones of the head and face which directly bear on surgical work in these regions. Anomalies are often embarrassing to the operator, as they cannot always be recognized until revealed while operating. It has been shown that we find the antrum—for example, the left one—so small in some cases, and the nasal cavity correspondingly large, that

the usual procedure of opening the antrum through the canine fossa in such a case would surely result in making an opening not into the antrum but into the nasal passage. This would not only be an excusable error, but would be productive of no harm. Studying the anatomy we find that the antrum on one side may be unusually small while on the other it is of normal size. Moreover, the antrum is not infrequently divided into numerous cavities by bony walls which extend from above downward.

This fact is sometimes misleading in the treatment of empyema, as the operator may penetrate a healthy cavity while an adjoining one may be filled with pus. The only reliable course to pursue, therefore, is to remove all bony substance so as to bring away all polypi, etc. Following the loss of the canine teeth, the deep groove and depression which invariably result along the alæ of the nose may be removed by the use of paraffin injected in a molten state into the muscular tissue beneath the grooves, thus lifting the depressed tissues and restoring the facial contour. By the use of paraffin injections we are now able to lift up depressed integument the result of wounds, and thus remove conspicuous facial deformities.

An anatomical point of interest to the dentist, and one which in a practical way is often a source of great annoyance to himself and his patient who unfortunately has lost his natural teeth and who therefore must make use of artificial substitutes, is the origin and attachment of the buccinator muscles, as well as the muscles forming the floor of the mouth. The usefulness of artificial dentures is often very greatly impaired, and in some instances made valueless, by reason of the dentist's failing to keep in mind the origin, insertion, and function of these muscles. Many an artificial denture otherwise perfect in its construction has proved a failure in consequence of the dentist's not observing the action of these muscles. The wise course to pursue is to construct a temporary gutta-percha plate with teeth attached and allow the patient to wear it a few days so that its behavior

may be studied and such changes made in its form as the muscular bearings on it indicate. If the denture is to be made upon a metal plate the plate may be used instead of gutta-percha. It is in the aged particularly, in whose mouths the muscular attachments—by reason of the atrophy of the alveolar processes—are close to their borders, that the muscles lift the plates from their place.

Another anatomical point of interest to be considered in the adjustment of artificial dentures is the relation of the nerves which supply the parts upon which the artificial dentures rest. We have, all of us, heard complaints from patients who wear artificial dentures that they experience the same character of pain as is felt on exposure of a dental pulp. In the case of the upper denture this is due to the pressure of the plate upon the terminal branches of the palatine nerves, as they emerge from the anterior palatine foramen. In the aged, pressure attended with pain may be made back as far as the posterior palatine foramen. This difficulty may be overcome by relieving the denture so that it will be impossible for pressure to be made over the foramen. In the lower jaw we find that late in life the mental foramen is very near the summit of the alveolar border, and as the inferior dental nerve emerges from it, it is subject to the pressure of the plate, with pain as the natural sequence. To prevent pain the plate should be constructed after the fashion of a saddle, so that no pressure will be exerted upon the nerve as it passes out of the foramen.

The anatomy and physiology of the fifth pair of nerves, especially the second and third division, is of very great importance to the dentist and oral surgeon, since facial neuralgia originating from diseased teeth and from other causes is often difficult of diagnosis and calls for the highest degree of skill in its management. I sincerely hope that the period in medical history will soon have passed when, in the treatment of cases of this character, for want of knowledge of the pathology of these parts, the dental as well as the medical practitioner will

resort to the reckless extraction of teeth.

Anatomical teaching of the innervation of the teeth has been, I believe, in description and illustration, by wax preparations and by models, in all countries, erroneous and misleading. For example, the inferior dental canal contains the inferior dental artery and vein and the inferior dental or third division of the fifth nerve. The works on anatomy teach that branches are given off from the nerve and artery which pass directly upward to enter the foramina of the various tooth-roots, each root being supplied with a branch. It is true that branches are given off from the trunks as described, but they do not enter directly into the dental foramina, but are distributed to the cancellated bony tissue surrounding the roots of the teeth, and there dividing into many branches are distributed to the pericementum and in the form of a plexus distribute small branches to enter into the formation of the dental pulp. This anatomical arrangement explains to us an interesting sequel to surgical operations for the removal of the inferior dental nerve in the treatment of neuralgia. If the description of the distribution of dental branches were such as is universally taught, to remove the inferior dental nerve would be to destroy the pulps of all the teeth to which these branches are said to be distributed; but, owing to the distribution being such as I have explained, we account for the continuance of the vitality of the pulps by the anastomosis of branches from the sympathetic system, as the principal nerves of the digestive system, etc. In my earliest operations for the removal of the third division of the fifth nerve I believed, according to the teaching on this subject, that destruction of the pulps of all the teeth supplied by this branch would mean loss of their vitality, but much to my surprise I found a state of partial anesthesia follow the removal of the nerve, and that within a brief period of time the teeth recovered normal sensation and were not injured in any way by the removal of the nerve trunk. Hap-

pily the usual teaching of this phase of anatomy is incorrect. We are able to remove necrotic bone around the roots of the teeth, and in case the membrane investing the apex of the root be preserved we are confident the vitality of the pulp will remain normal.

Surgical operations called for in the treatment of trigeminal neuralgia, preceded by careful, skilful diagnosis, require great delicacy of manipulation in order to obtain good results and avoid conspicuous cicatrices and other deformities of the mouth and face.

It is customary for the general practitioner of surgery when operating on the maxillary bone, or in the performance of operations within the mouth that are of considerable magnitude, to make external incisions in order to gain access to and obtain a full view of the field of operation. I hold that these external incisions, followed as they are by the formation of scars, are, in a large majority of the cases in which they are made, wholly unnecessary. For example, a patient suffering from persistent neuralgia of the second and third divisions of the fifth pair of nerves, having undergone medication over a period of many months with only temporary relief, is taken by his physicians to a surgeon for diagnosis and treatment. The surgeon decides that a nerve lesion exists, and that an operation is required in order to cure the patient. The patient is prepared, the operation is proceeded with, and an external incision is made in accordance with the location of the lesion. If the affection be of the inferior dental nerve, the incision is made along the border of the jaw, the tissues are reflected up so as to expose the external surface of the inferior maxillary bone, a hammer, mallet, and chisel are made use of, a section of the bone is removed so as to expose the inferior dental canal, and the nerve is extracted. A saw is sometimes employed instead of a chisel for the purpose of removing the external layer of bone covering the canal. The wound is closed by suturing, and the patient is cared for antiseptically until it heals.

External incisions are wholly unnecessary in the performance of these operations. They may be successfully performed within the mouth by proceeding as follows: A small incision should be made downward from the mental foramen so that the canal may be entered with a silver probe, before which by the use of the bur the bone is cut down a little way so as to get access to the canal, then a drill after the form of Gates' dental root-canal drill exaggerated in size may be carried into the canal and the contents thoroughly removed. In order that the nerve may not re-develop, as it is inclined to do, the canal may be drilled out so as to freshen the surface of the bone, thus causing an exudate to take place from the freshened bony surface and consequent filling of the canal with bony tissue. Experience has taught us, however, that the canal does not always fill with osseous tissue, and the nerves may be reproduced in certain cases.

I am of the opinion that there is no more reason for making an external incision for the removal of the inferior dental nerve within the substance of the maxillary bone than there would be to make an external incision through the cheek to gain access to the third molar tooth for the purpose of entering the pulp-chamber and removing the pulp therein.

Neuralgia of the second division of the fifth pair of nerves or the infra-orbital nerve frequently requires surgi-

cal operation for its cure. It has been customary in performing these operations to make external incisions, for the purpose of entering the infra-orbital foramen and making sections of the nerve. Easy access to the infra-orbital foramen may be demonstrated by placing an instrument in the mouth, carrying it upward toward the orbit, placing a finger over the infra-orbital ridge, when the instrument will be found to extend within a half-inch of the infra-orbital foramen.

It may be readily seen that equally good results are obtainable by raising the cheek and making an incision over the canine tooth. Dissecting up the soft parts, seizing the nerve with a tenaculum as it makes its exit from the infra-orbital foramen, carefully dissecting out its branches distributed to the cheek, nose, and lip, then increasing the size of the infra-orbital canal by means of a small drill, seizing the nerve, drawing it forward and dividing it, will accomplish the same end that is obtainable by making an external incision.

It is true that now and then we meet cases of such character as to make external incisions in operations upon the face a necessity, but I feel that every operator in considering the best interests of his patient, in all cases where it is possible to do so ought to operate within the mouth, and thus avoid the formation of scars which will be a disfigurement to the patient through life.

SINUS OF THE FACE.

By **JAMES E. POWER, D.M.D., Providence, R. I.**

EXTERNE ASSISTANT DENTAL SURGEON RHODE ISLAND HOSPITAL, ASSISTANT DENTAL DEPARTMENT ST. JOSEPH'S HOSPITAL, PROVIDENCE, R. I.

MR. A., aged thirty, called at my office on March 10, 1903, for my advice. As is customary in cases requiring surgical interference, I first proceeded to get a history of the case, which was as follows: During the past

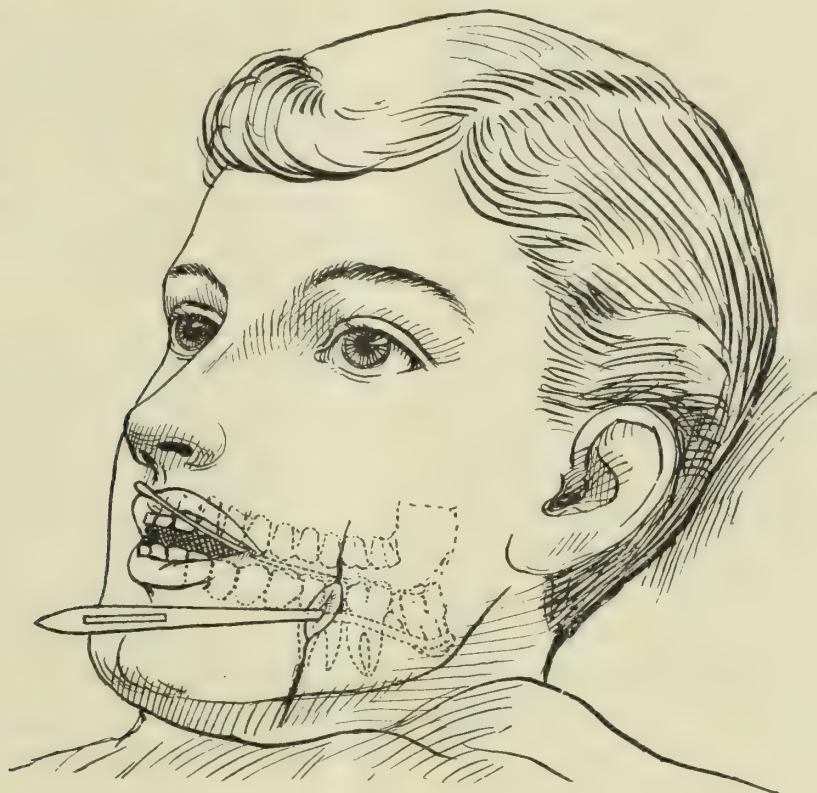
few years, and about once each year, the patient had been annoyed by his face assuming abnormal proportions. There was no pain associated with this swelling, so his sufferings were confined to the mental rather than the physical nature.

He had adopted no special treatment, as the swelling had always disappeared without it, until the last attack, which occurred in January 1903.

At this time he became worried, and visited a surgeon for advice. He diagnosed the case as one of "obstructed sebaceous duct," and advised the application of an ointment. The patient used this for a few days, at the end of which time the swelling had increased, and the

tissues, and highly inflamed about the area of the old incision, which had now closed, as no wick had been used to keep it open. The pus was centered at this point and was ready to break through under the least pressure.

I next examined the inside of the mouth and found everything normal, with all the teeth present on that side of the mouth. They seemed to be free from caries, and questioning of the pa-



pus which was now present became confined to one particular area, under the condition which is sometimes known as "pointing." The surgeon then made a vertical incision, perpendicular to the body of the jaw instead of horizontal and parallel with it—leaving an unsightly and inexcusable facial disfigurement. He discharged the patient with instructions to return every second day. The patient carried out said instructions, and during the next month his face was incised four times—that is, the first incision was reopened four times—but his condition was not improved.

After obtaining the above history, I made an examination which revealed the following conditions: The face was very much swollen, very sensitive to the touch, due probably to the presence of pus in

the tissues, and highly inflamed about the area of the old incision, which had now closed, as no wick had been used to keep it open.

I examined more closely, and found the lower left third molar tipped slightly forward in such a manner that the upper anterior surface of the third molar rested against the second molar, as is shown by the diagram (which was drawn from models).

By means of an ordinary surgical knife, I reopened the old incision on the outside of the face and by pressure expelled about half an ounce of thick yellow pus. I then introduced a surgical probe into the opening, backward and downward for about one inch and a quarter. I could not force it into the oral cavity, neither could I feel it when I put my finger on the inside of the cheek, as it seemed to be imbedded

deeply in the tissues. I removed the probe and advised the patient to have the lower third molar extracted, and the socket thoroughly curretted, as a cure for his trouble, as I thought it due to the position of the third molar, causing undue pressure.

He did not seem satisfied that his teeth could have caused this difficulty, as he had never had a toothache, so he paid me for my advice and departed.

About three months later, he called at my office again; his condition at this time was much worse; the incision had been made longer; he was suffering from pain in his cheek, and his jaws had become closed so that it was impossible to pass a No. 4 mouth-mirror between the upper and lower teeth. He told me he had been treated by two surgeons, to whom he gave my diagnosis, and both of these gentlemen said it was not correct. One said it was due to an obstructed sebaceous gland, and treated him accordingly. But as the patient did not improve, he visited another surgeon, who said he had necrosis and who opened and extended the old incision, at the same time curretting the bone. He made twenty or thirty visits to this latter practitioner, and seemed to be continually getting worse.

When he again presented himself to me he was willing to submit to any treatment I might suggest. I made arrangements for the operation on May 8, 1903, when it was performed as follows:

I first gradually forced the mouth open and extracted the lower left second and third molar teeth. I curetted the sockets thoroughly and irrigated them. I next introduced the probe into the opening on the outside, which was opposite the first molar tooth, as is shown on the diagram, and passing it backward and downward toward the angle

of the mandible it did not appear in the mouth, so I began to feel with my finger in the socket of the third molar. I soon felt the end of the probe, which I gradually bent and directed through the natural opening of the oral cavity. With the probe in position, I had the accompanying diagram made by an artist whom I had present.

I then removed the probe, and syringed through the surgical opening into the mouth a warm solution of dioxid, followed by glyco-thymolin. Then I passed a wick of plain sterilized gauze, upon which I sprinkled "modoformal," through the same opening into the mouth, and put on a bandage.

I carried out this treatment every day, making the wick shorter, and syringing, each time. After the third day I injected a four per cent. solution of silver nitrate through the tract before inserting the wick. This was done to promote granulation and to assist the opening to close, which it did, from within outward, and on the eighth day I discharged the patient cured; sinus entirely healed.

I shaved all the hair from the outside of the cheek, and kept it this way during my treatment.

This is one of the many cases which I have had the good fortune to either observe or to treat tending to prove that the teeth are of more importance in the conditions of the body requiring the services of a general surgeon than is ordinarily supposed. I report the case purely from a sense of duty, hoping that others may derive benefit therefrom, as the experience of others has helped me. If this report will assist in relieving any unfortunate patient, or assist even one of the many brother practitioners who read this journal in clearing cases which may be termed obscure, I shall feel that the mission of this report has been accomplished.

REFLEX NEUROSES OF DENTAL ORIGIN AS MANIFEST IN EYE, EAR, NOSE, AND THROAT DISEASES.

By A. D. McCONACHIE, M.D., D.D.S., Baltimore, Md.

(Read at the seventh union meeting of the Maryland State Dental Association and the District of Columbia Dental Society at Baltimore, May 21, 1903.)

MY first thought when asked to address you on this subject was to report a number of cases bearing upon the various reflexes of dental origin; but it seemed unnecessary, as I believe everyone present can call to mind cases of the very character I shall refer to in a brief *résumé* of this important subject.

Before entering into the subject assigned me, I trust you will pardon me in digressing to speak a few words on the importance to the dentist of a thorough knowledge of the fundamental studies— anatomy, physiology, chemistry, materia medica and therapeutics, pathology and bacteriology. Dentistry cannot be divorced from medicine. It is as much a specialty of medicine as is ophthalmology, otology, laryngology, or rhinology. The dentist's education must not be solely manipulative. He should be grounded in the general principles of medicine and know how to apply them to his specialty. The mouth cannot be isolated from the rest of the body. The same blood that circulates in the mouth and teeth circulates in the heart, liver, kidneys, and extremities. Hence with such a broad blood supply and nervous connection, with such great possibilities for irritation and remote nervous manifestations, you must understand the whole body and make a study of it in its completeness before you can render the most suitable treatment— whether preventive, palliative or curative—in the various diseases of the oral cavity. The principles of disease are the same whether they occur in the deep-seated internal organs, the extremities, or the teeth. A working knowledge of

these elementary principles in one set of organs requires the same studies as that of any other group of organs of the body. Your surgical procedures do not differ from those elsewhere in the body. The same aseptic and antiseptic principles are as necessary in dentistry as in general surgery.

That dentists are fully appreciating systemic causes of the local conditions they treat is significant of a rapid advance and elevation of your standard for graduation. Your advance to a four years' course is significant and prophetic of a more thorough familiarity with the fundamental studies. It seems to me to indicate that your schools mean to exact more thorough knowledge of those subjects which have hitherto been thought to have little to do with dentistry by the average graduate.

Medical and dental students should be educated upon the same lines as to the fundamentals, only diverging in the higher branches and laboratory work.

In my criticism of educational standards I must not neglect to arraign the medical graduate before the bar of ignorance as pertaining to the principles of dentistry. The medical graduate should fully understand the process of dentition in its relation to local and constitutional effects. Every close-observing medical man—no matter what specialty he practices—cannot help appreciating the invaluable aid afforded by a familiarity with the clinical appearances found in the oral cavity and teeth. I need only refer to the discoloration of the gums in metallic intoxications, to the bleeding, spongy, and hypertrophied gums in scorbutus, to the salt incrustations of teeth

in gout, to indicate the valuable knowledge in diagnosis which familiarity with oral conditions affords the general medical man.

Again, in treatment how frequently do we see remote neuralgias—supra-orbital, infra-orbital, occipital, frontal, and ocular—baffle us until the dentist discovers and removes an exposed pulp.

My personal experience has been so replete with instances of the invaluable services of the dentist's skill that I feel that I would only be half prepared for my special work were I not a dental graduate. Thus the utility of all kinds of knowledge is made evident if we would be broad-gauge in our work as specialists. Medicine is one, and embraces the whole man. The specialist, be he dentist, ophthalmologist, or any other "ist," must not become narrow, but look upon the body as a whole composed of units so correlated that a disturbance of one produces discord in every other. Keeping these facts in view must develop a widespread interest among dentists and physicians as to their mutual aid and relations.

Now to the subject assigned me: "Reflex Neuroses of Dental Origin as Manifest in Eye, Ear, Nose, and Throat Diseases."

In regard to the nature of reflex neuroses, suffice it to say that we usually understand by it a process consisting of a nervous impulse starting at the peripheral termination of a sensitive nerve, carried through it to a sympathetic center, and from there carried back to its source, or to a distant point, where it manifests itself in an excessive or disordered vasomotor, sensory, or muscular activity. To account for this disordered activity we may suppose that the terminal nerve filaments are diseased or subject to undue irritation by disease of their environment; or that there is disease of the nerve trunks or their ganglia, or that there is a general sensitiveness of the nervous make-up of the individual. Pathologists have as yet not determined the real facts in the case. Clinicians, from the phenomena observed, vary widely in their theories and hypotheses.

Within the last decade—the era of the rise of specialism—each specialty in its turn has laid claim to the eye, nose, uterus, stomach, etc., as the cause of the various reflex neuroses so frequently seen. Whilst no one organ dominates all neuroses, careful observation has given us a useful catalogue of reflexes emanating frequently and positively from certain organs and ascribable thereto.

The last aspirant for honors in the field as a cause of reflex neuroses, I believe we can safely say, is the tooth. That it can vindicate its title I think can easily be proved by many careful observers. The dental organs are far-reaching in their influence through their intimate and extensive nervous connection through the fifth nerve, and thus with the eye, ear, nose, and throat as their organs of most frequent attack.

Many observers have published records of affections of the eye attributed to decaying or decayed teeth. The most frequently observed and reported cases are those of inflammation of the conjunctiva—of the pustular or phlyctenular type. These cases are seen daily in our dispensary clinics, and in many instances have I observed the association of decayed teeth or difficult dentition. Whilst the teeth are not the sole cause of the trouble, one can frequently—as I often have done—expedite the relief by careful attention to the teeth in conjunction with proper dietetic, hygienic, and medicinal treatment. Again, in certain inflammations of the cornea (keratitis), carious, irritable teeth are frequently associated.

The Hutchinson (syphilitic) teeth, you well know, are usually associated with corneal inflammations of luetic origin. My invariable rule in seeing an inflammation of the cornea in a cachectic youth or adult is to look at the teeth for manifestations or verification of my suspicions of the constitutional taint. As dentists you can ever bear in mind in these cases, with characteristic Hutchinson teeth, to look for evidence of past corneal inflammation manifested by ground-glass appearance of the cornea. If no past evidence is seen, make a prophecy (to yourself, of course) of

some future eye trouble. Bear in mind, however, that the teeth are not the cause of the eye disorder, nor *vice versa*, but that a common underlying cause (inherited syphilis) prevails.

Amblyopia (partial loss of vision) in varying degrees has been recorded by Hutchinson Gill (1872), Samelsohn (1877), and Bull (*International Dental Journal*, March 1898). Of such I have had no experience.

Optic neuritis from dental disease has frequently been recorded, however. Such cases are usually secondary to orbital periostitis or cellulitis following suppuration in the antrum. Every one of you have seen antral suppuration of dental origin and doubtless involvement of the other sinuses, including ethmoid, frontal, and sphenoidal. That such an indirect cause can be a cause of optic neuritis is readily understood when you take into consideration the proximity of the optic nerve to the diseased sinuses.

The most frequent ocular disturbance seen in connection with dental irritation is that of accommodative weakness. This, again, is due to the common nerve supply. The ciliary nerve supplies the ciliary muscle—the muscle of accommodation—being a branch of the fifth nerve. Schmidt has published (*Arch. f. Ophthalmol.*) a series of 92 cases; he found limitation of accommodation in 73. The condition was most frequent in young individuals. The opposite of this, viz, spasm of accommodation, has also been noted in cases of disease of the teeth. My own experience, whilst not so large, confirms the frequent association of irritability in the use of the eyes for near work (in accommodation) where defective, painful teeth are present, and hence the appeal for glasses and an examination, when no defect or refraction has been found, the sole cause residing in the irritability of the ciliary muscles due to diseased teeth. My advice to such patients is, "Consult your dentist." Baumeister has related a case of complete paralysis of the muscles of the eyes due to dental caries. This, however, may be attributed to periostitis of the

sphenoidal fissure, possibly from infection from a decayed tooth.

To illustrate how vigilant we should be in our endeavors to find the cause of disease—and thus the cure—the following case from my note-book is interesting: An adult consulted me in 1898 for an irregularity of pupils—the left being dilated—the history being that for some time off and on he would notice the variability in the size of pupils with no other disturbance. Vision good, but the appearance was objectionable. On examination I could find no cause for the trouble—systemic or local. He had not been using mydriatics or drugs. The pupils would contract with eserine, and resume dilatation upon its withdrawal. There was no error of refraction. No relief was obtained from any measure until two decayed teeth on same side were treated.

Zonular cataract (congenital cataract) is frequently accompanied by dental defects, the canines and incisors being marked by transverse lines, furrows, and terraces. This is merely an association due to common constitutional causes, no relationship existing between them.

Dental irritation in its effect upon the ear in producing and in modifying the course of ear diseases has excited and is exciting much interest and investigation among the most progressive aurists. Yet many otologists and practitioners do not give the subject the attention it deserves, nor are they duly impressed with the importance of dental irritation in the causation and treatment of ear diseases. Observing the close sympathetic nervous relation which exists between the ears and the mouth and teeth, one readily understands that irritation from the teeth can be a source of disturbance to the organs of hearing. It is extremely difficult to convey a due appreciation of or even to rightly account for general nervous manifestations due to dental irritation, even though slight locally. That dentition, especially the eruption of the third molars, the presence of decayed or diseased teeth, the wearing of badly-fitting dentures, etc., should frequently excite reflex trouble in the organs of

hearing is easy of explanation when we consider the close anatomical relationship through their nervous connections. Reflex irritations are daily seen by aurists in irritation of the ears in various ways, such as the introduction of specular applicators, etc., to the external auditory canal, giving rise to sneezing, coughing, or a desire to swallow.

Sexton in 1880 and 1888, and Burnett in 1884, have published elaborate articles on the effects of oral irritation on the ear.

The importance of recognizing early irritation from teething as a cause of earache in infants cannot be over-emphasized, affording a means of speedy relief by incision of the gums before congestion and its sequela, suppuration, supervenes, with its grave dangers to hearing and to life.

To rightly appreciate aural disturbances due to diseases of the teeth and gums, it will be well to review briefly the nervous relationship between the ears and the nose, mouth and pharynx.

The nervous mechanism of the tympanum—known as the tympanic plexus—is connected with that of the mouth, nose, and throat through branches arising chiefly from the otic, petrosal, and Meckel's (spheno-palatine) ganglia. The inferior maxillary or third division of the fifth pair is connected with the plexus through the otic ganglia. The tympanic or Jacobson's nerve arises from the petrosal ganglion of the glosso-pharyngeal nerve. The superior maxillary or second division of the fifth pair is connected with the tympanic plexus by the vidian nerve through the spheno-palatine ganglion (Meckel's). The carotid plexus of the sympathetic, also, is connected with the glosso-pharyngeal by the tympanic branches of Jacobson's nerve. Thus we see how the nervous communication between the ear and the superior cervical sympathetic ganglion is established; other minor connections exist, but this review suffices for our purpose of showing how the teeth, palate, and mucous membrane of the oral, nasal, and pharyngeal cavities are brought into relationship with the drumhead, the tym-

panic cavity and its contents, and the external auditory canal.

Chronic or long-standing irritation in one part of the mechanism can and will ultimately manifest itself in reflex irritation elsewhere, causing nutritive or trophic changes therein. The tympanic cavity, owing to its rich blood and nerve supply, is peculiarly adapted to such changes, especially in those of low vitality.

Your experience will corroborate mine in stating that sympathetic aural disturbance is liable to occur during first dentition, beginning with the eruption of the incisors to its completion at the end of the second year, and later from the presence of remains of the deciduous teeth until their removal or absorption. In such cases examination of the ear will show more or less reddened drum membranes accompanied frequently by a purulent process to be followed by more or less deafness. My case-book contains pages of such a picture. Second dentition in all of its phases from the beginning at or about the fifth to the seventh year, and the eruption of the first molars, to the eruption of the third molars at or about maturity, is frequently accompanied by aural irritation, made more susceptible by the strenuous life of the schoolroom. The eruption of the third molars may cause much general disturbance and be accompanied by suppuration of the middle ear in conjunction with tonsillitis, pharyngitis, and abscess of the gums. These cases are familiar to all of you.

Much has been written and said in reference to the causal relationship between dental irritation and chronic catarrhal non-suppurative inflammation of the middle ear, the most frequently observed cause of deafness. The cause of middle-ear catarrh is very obscure, and every case should be examined as to the condition of the teeth, bearing in mind that long-continued reflex irritation from diseased teeth may be a potent factor in its production.

Sexton in a review of eighteen hundred cases of ear disease found that one-third of them originated in or were more

or less prolonged by a diseased condition of the teeth, the male sex somewhat in excess of the female. In both sexes the greater number were affected between the twenty-first and fortieth years. The chronic ear affections greatly exceeded the acute forms.

Aside from decayed or otherwise neglected teeth, as a cause of aural irritation, how frequently do we find the artificial measures—plates, fillings, bridges, etc.—to be the exciting causes. Badly fitting plates, bridges, broken but painless teeth, cavities imperfectly cleansed of decayed matter bearing fillings—all are sources of pain and irritation. Artificial plates, badly fitting or of injurious material, worn over decayed roots and inflamed gums, or worn day and night without cleansing, increase any irritation already existing.

In this place permit me to report briefly an interesting and instructive case seen August 26, 1902:

Case of J. W. B. Male. aged forty-eight. Complains of pain in left ear, on swallowing, for past ten days. Cannot open the mouth or protrude the tongue without excruciating pain in the ear. Examination revealed a normal drum and hearing. No evidence of inflammatory trouble. On examination of the oral cavity a slight excoriation of left side of tongue was noticed, and on friction with cotton-tipped applicator pain in the ear could be elicited. One of his lower molar teeth was roughened on the edge, which I advised should be smoothed, and I dismissed him with an antiseptic wash and potassium iodid internally, suspecting a possible mucous patch although no specific history could be obtained. I saw him at intervals of two or three days and had him increase the iodid rapidly, with no improvement but rather an increase of the thickened excoriated surface on his tongue border. On the 13th of September—two weeks after seeing him for the first time—I suggested to him the grave possibility of its being an epithelioma or cancer of the tongue, and advised him accordingly. He was dismissed to return three days later and no improvement noticed. I told him I

could not be responsible for the final result unless he consented to have a consultation or its removal. I had him see my friend, Professor Chambers, who gave him the same opinion and advised operation. He consented, and the operation (removal of a portion of the tongue) was done one week later, with cessation of all phenomena and retention of a fair speaking voice.

This case shows the grave conditions likely to follow irritation from diseased teeth as well as reflex phenomena in organs more distantly located, as in this case, his sole cause for consulting me being for pain in the ear, never suspecting any trouble in his mouth or teeth.

Enough has been said to call your attention to dental irritation as a frequent cause of aural affections.

The painful results of dead or diseased teeth in the mouth cannot be overestimated. The ear, being kept in a chronic state of hyperemia, is much less able to withstand the effects of exposure and other catarrhal influences.

This interesting subject could be elaborated in greater detail, but I have said enough at least to direct your attention to the remote effects of disease of the organs you treat; but before I conclude permit me to say a word in reference to a phase of our work which has a mutual bearing, although possibly not directly of reflex origin—the influence of nasal and naso-pharyngeal obstruction upon development of the teeth and palate, and the detrimental effects of mouth-breathing due to these causes, the most frequent of which are adenoid growths in the naso-pharynx. These growths take precedence both in frequency and consequence. Among the sequels of neglected adenoids are high-arched palate and irregular teeth. We have two varieties of deformities, depending upon whether the adenoids were present before or after the second dentition. If before, the palate becomes higher and distinctly dome-shaped, the alveolar process forms an ellipse, the lateral portions approach the median line, the whole growth of the maxilla is

retarded, but the teeth are in the normal position. If after the second dentition the adenoids are still present, the alveolar approximation is still more marked, the palate more elevated, approaching the Gothic type of arch, the anterior part of the alveolus inclines forward, and the jaw assumes the V-shaped form so frequently seen. These changes result in certain alterations of the teeth. The central incisors are so rotated that their lingual surfaces look toward each other. The labial incisors and frequently the bicuspid are pushed inward while the molars turn outward, the maxilla and mandible do not develop at the same rate and the normal articulation is interfered with. That these conditions are due to nasal obstruction there can be no doubt. This is proved by both clinical observation and by the experiments of Ziem, who produced the same changes in young animals by blocking their nasal chambers with cotton-wool. When but one side was occluded the changes produced were obvious. There was a general arrest of development of the maxilla, the palate and frontal bones, the ear, and the whole side of the face.

One explanation is that normal descent of the palate is interfered with by the adenoids which interfere with the general development of the child. The sphenoid and the septum fail to develop, while the alveolar process and the face in general grow at the usual rate. Another theory is based on the fact that in mouth-breathers the tongue is not in

contact with the maxilla and there is no internal force to counteract the inward pressure of the cheeks. As a result the jaw is narrowed and lengthened. During the change from the temporary to the permanent dentition the great vascularity of the maxilla causes softening which allows the marked changes that occur at this time. Another explanation is that as the air passes through the mouth there is negative pressure on the palate and consequently it is drawn upward. Doubtless all these factors are at work, as well as the trophic nerves. Thus is seen the importance of an early recognition of obstructed nasal respiration in order that one may give the proper advice to the fond parent in reference to the removal of the adenoids.

Here again, then, is evidence of the interdependence of all specialties in medicine, rendering a mutual aid society of all specialists necessary if we would do the best for society and humanity and win the gratitude of our suffering humankind. The specialist who is of the narrow-gauge type, who lives within his limited horizon—be it confined to the teeth, eye, ear, nose, throat, urethra, rectum, or uterus—cannot do full justice to his calling or his patients. He will frequently find patients whom he has doped, purged, and dieted world without end, and with no relief, take the matter in their own hands and consult someone with broader views of the causation, prevention, and treatment of diseases.

THE TREATMENT OF INTERSTITIAL GINGIVITIS (PYORRHEA) BY THE X RAY AND HIGH-FREQUENCY CURRENTS.

By CHARLES HADDEN PARKER, M.D., D.D.S., Chicago, Ill.

THE student who wants to study X-ray therapeutics will find, after hunting through all the books now published on X-ray subjects, that none of them contain anything on the treatment of diseases of the mouth by the X ray. I will qualify this statement: I have looked through nearly all of the latest published books, and have found nothing on the subject. In Monell's late work will be found an elaborate description of the methods and uses of skiagraphy, by C. Edmund Kells, with the following statement: "We may safely assume that the chief practicable application to dentistry is through the art of skiagraphy." Of course the application has been confined so far to that work almost entirely, but I feel that there are a great many other ways in which the X rays will be used in the future by the up-to-date and progressive dentist. It may be that some will be successful in treating carcinoma of the mouth. I have personally assisted at and watched several cases of this character. The treatment, however, was of no avail.

But there is another thought: We may learn by our failures. There are certain portions of the body, such as in cases of cancer of the breast and lips, that are not susceptible to the X-ray treatment. By the use of certain chemicals taken internally it might be possible to assist the X rays to a complete cure. This, according to Dr. Bevan, is called radio-chemic therapy. I am now working on this line, and at a later time will make known with what success. For the present I shall confine myself to the treatment of interstitial gingivitis, or pyorrhea alveolaris, by the aid of the X ray and high-frequency currents.

I have found that the X ray alone will not cure pyorrhea. In treating twenty-four cases there was no perceptible change. But by following up the X ray with the high-frequency current, I was delighted to see the improvement in every case upon which it was used. I shall not attempt to go into the minutiae of all the effects produced. In fact, I could not if I would, as at this time I have not learned the precise effects and changes produced in the gums and the mucous tissues by the X ray and high-frequency currents used in combination.

It is known, however, that the X ray destroys or causes the death of tissues it passes through should the latter be exposed to it for a long time or be subjected to frequent continued exposures, and that diseased tissues are affected more quickly than are healthy tissues. Also, that the exposures must not be too frequent or cover too large an area, as the blood will become surcharged thereby with dead matter of which all cannot possibly be carried off, thereby causing toxemia.

Each operator must learn to know his instrument and its capacities. He must then ascertain the amount of ray his patient can accommodate, together with the density of ray and the exposure required for each individual. Some are more susceptible to it than are others; some will require but one treatment, others more.

The first thing to be done when a patient comes in suffering from pyorrhea alveolaris is to thoroughly cleanse the mouth by flushing out with a good wash. Borolyptol is excellent, as it contains a percentage of formalin. The patient

must be made to understand that a small quantity of the wash—say a tablespoonful—taken into the mouth will not suffice. The mouth must be literally flooded, and several times at that. Then hydrogen dioxid must be injected around the necks of the teeth and into all pockets, thoroughly washing out all pus. Next remove carefully all calculus, as tartar, from teeth. This cannot be successfully done at one sitting, but the greater portion may be taken off, and at the next two sittings one can remove the remainder. When I say “all,” I mean every particle that is on any tooth; and be sure to go to the bottom of every pocket, and remove all serumal calculus from roots, for on this hinges the success or failure of the treatment. When this has been done, and the mouth has been thoroughly washed again, spray the gums all around with a mixture containing iodine, aconite, myrrh, and wintergreen. This will be found to be the hottest mixture ever used, but it will also “whip” sluggish gums into line, and greatly aid in the treatment that follows. An atomizer is the best thing with which to apply this mixture, and there will be no blistering of gums.

Immediately after the spraying the patient is arranged in position for the X ray. I use a lead mask to cover the upper part of the face and the hair, and begin the exposure on one side of the face, requesting the patient to slowly turn the head until the other side of the face has been exposed. This exposure generally lasts from one to two minutes, but under no circumstances do I expose longer than two minutes. When this has been done, I take a glass vacuum electrode especially designed to suit the shape of the face, and then turn the high-frequency current on and cover the same ground previously covered by the X ray. When the front of the face is reached, I place the electrode over the patient's mouth, requesting him to open the lips and keep the teeth shut; also to breathe through the mouth. In this position I keep the electrode for about five minutes, the exposure varying according to the case under treatment.

This completes the first treatment. The subsequent ones will be much the same, except that the exposures are varied according to the condition of the gums.

The object of spraying the gums with medicament before turning the X ray and high-frequency currents on the patient is to have the chemicals carried into the tissues by these currents, thereby getting all the forces possible arrayed against the disease. Now, as the X ray destroys diseased tissue the high-frequency current stimulates the flow of blood, and helps to carry off the poisons thrown down by the X ray.

Oudin's report to the International Congress in 1900 is summarized as follows: The effects of the high-frequency currents can be divided into the following actions: (1) On motor or sensory nerves. (2) On circulation. (3) On oxidation generally. (4) On micro-organisms. The effect on the motor and sensory nerves varies according to the technique of the operator, and whether a very high- or low-frequency current is used. We will find on applying the vacuum electrode that there is a lowering of blood pressure and a vascularization of the part thus covered, causing a most active draining of circulation and carrying off of oxidized matter. If the high-frequency current does not actually kill microbes, their vigor can be attenuated. The process of decomposing and reconstructing the molecules in gum tissue is greatly aided by the generation of ozone, in the nascent state, as it is given off from the vacuum electrode.

When I place the electrode over the patient's mouth, it is to bring the ozone into that cavity, where it will be easily carried into the gums and surrounding tissues. There is also a great amount of ozone inhaled, producing a quieting effect upon the patient. Upon the tissues coming in contact with the nascent ozone the effect is one of oxidation, with a consequent increase of the metabolic changes. In this way the natural process of regeneration is assisted and local congestion relieved.

As an experiment, if the vacuum elec-

trode be placed over the epigastrium of a patient having habitually cold hands and feet, the reaction begins immediately, and a glow will come over the whole body, with a feeling of warmth.

SOME CASES TREATED.

The following cases I submit as living evidences of the good effects produced by the radio-chemic and high-frequency currents when used in combination:

Mrs. K., aged forty-two, wearing full upper plate; lower ten anterior teeth still in mouth.

First sitting: Teeth found to be very loose, with great tenderness; accumulation of very hard calculus around roots, with deep pockets; great quantity of pus oozing from pus pockets around each tooth. Treatment as already described.

Seven days after the first X-ray treatment she called again. Soreness had disappeared; teeth quite firm; gums hugging teeth; not a particle of pus showing on pressure. Seven days later she called, when gums were as pink as in perfect health, and very hard; absorption of diseased portion of gums complete. Patient discharged as cured.

Miss J., milliner. Chronic case of pyorrhea of long standing. I had given her the usual treatment for the disease at different intervals before, with but indifferent success. She returned after about eight months to have the condi-

tion treated again. This time I used the X rays and high-frequency currents, and after five treatments I discharged her as completely cured.

Mr. L., aged forty-five, mining engineer. A very discouraging case of chronic pyorrhea of many years' standing. I had previously treated him at two different times in the usual manner, with little or no result. About one year after the last of these treatments he returned from Mexico, and I determined to experiment in his case with the X ray and high-frequency currents. I confess I was just as much surprised as he was to see the results after the third treatment. In all I gave him seven treatments, and by that time his gums were the "pink of perfection," and his teeth quite solid, the latter having previously been very loose. There was no pus around the necks of the teeth. I considered him cured.

Of course it is understood that the patient must co-operate with the dentist, and keep the mouth well cleansed with a good wash, at least four times daily, using a good brush at each washing.

I could furnish records of many more cases, but as the recital would take up valuable space, I will let these suffice. If any fellow practitioner interested in seeking methods that will most benefit his patients will enter into this work carefully and intelligently, I am satisfied that he will reap great results.

PROCEEDINGS OF SOCIETIES.

FOURTEENTH INTERNATIONAL CONGRESS OF MEDICINE, MADRID, APRIL 23 TO 30, 1903.

Section XII: Odontology and Stomatology.

(Continued from page 882.)

FRIDAY, APRIL 24TH—*Afternoon Session—continued.*

At this session Prof. W. D. MILLER, Berlin, read a paper embodying the results of his studies on the question of immunity in the human mouth. (This communication is here omitted, inasmuch as a report of his investigations on this question has already appeared in the DENTAL COSMOS—see issues for January and February 1903.)

After the reading of a paper on "Bucco-Facial Prosthesis" by Dr. CLAUDE MARTIN of Lyons and Professor DELAIR of Paris,

Dr. TRUMAN W. BROPHY, Chicago, read a paper on "Anatomical Landmarks of Special Interest to the Dental and Oral Surgeon" (published in full at page 935 of this issue of the COSMOS).

Discussion.

Dr. CRYER. I am proud that America should bring such a paper as that of Dr. Brophy's, yet in many points we do not agree. As to the canine fossa as the site for opening into the maxillary sinus: This has been taught by many, but it is a great mistake. Twelve years ago I was asked to open into the maxillary sinus in that way, and the patient said, "You are in my nose." It was a fact. That caused me to make numerous sections, and I found that in twenty-five

per cent. of the cases you will enter the nose and not the sinus.

Dr. Brophy and I also differ in regard to the nerves passing into the roots of teeth, especially in the lower jaw. It has been said that the nerve does not pass directly through the foramen into the tooth. I have spent more time in discussing this point, in endeavoring to convince Drs. Brophy and Barrett that old anatomists were right in this matter and that the young men are wrong, than I can tell you. I could put it on a screen now and completely demonstrate that the nerve branches pass directly into the foramen. This argument is given: If they do pass directly in, the teeth would be devitalized by the removal of the inferior dental nerve. I am well aware that Dr. Brophy has told us that he has made the experiment, and that "the tooth has stayed vital but the sensation has been lost for a time; a year later the sensation of these nerves has been re-established."

In operating upon the lower jaw for the removal of the inferior dental nerve, I am pleased that Dr. Brophy spoke of raising the tissue so that after operation the scar is not visible.

In regard to opening the bone, I would not recommend the old practice of hammer and chisel. We have, devised by Bonwill, a surgical engine which can open the jaw—open the brain-case—and by which sections of bone can be removed in five or six minutes where the ordinary

surgeon occupies twenty to twenty-five minutes.

I indorse the doctor's suggestion to open through the mouth, even if it be necessary to remove a great mass of the superior maxilla.

Now, there is another point in which we differ. It is as to removing the nerve from the inferior dental canal. The doctor spoke of opening down and passing a silver probe along the line of the nerve. I find that if I pass a probe into the mental foramen it will not go backward, but forward. The operation cannot be done on a normal jaw without taking a surgical engine and cutting downward and backward until the canal is reached.

Dr. BROPHY. That is what I always do; you must cut through in order to get in, of course.

Dr. CRYER. I am glad the doctor spoke of the operation for section of the infra-orbital nerve. It is a disgrace for the medical profession to open the face and make everlasting scars on the face of man or woman. The true operation as performed upon several occasions by the late Dr. Harrison Allen and by myself is as Dr. Brophy described it.

Dr. PORTUONDO. I must say that I have been very pleased by this paper. In talking about the antrum, Dr. Brophy spoke of entering it through the canine fossa. My experience is not great, but I find it most difficult thus to reach the antrum by the canine fossa, while I have always struck the right place by going through the upper second molar. I should like Dr. Brophy to tell me how he can diagnose the state of the different departments of the antrum as he spoke of doing.

Dr. CRYER. I wish to announce that last year, Dr. Aguilar, when at the University in Pennsylvania, saw a collection of bones I have, and asked me to bring them to this meeting. I have brought over one hundred specimens, which will support Dr. Brophy's paper to a very great extent. There are specimens of antra that are lacking on one side and wide on the other, and of various different operations. If Dr. Aguilar will

make arrangements for this exhibition, it will give me very great pleasure to show them to you and explain them.

Dr. AGUILAR. Gentlemen, I wish to call your attention to this announcement: To-morrow at the Facultad de Medicina there will be a lecture given by Dr. Cryer on this subject similar to the one presented by Dr. Brophy this morning: "The Practical Teaching of Anatomy in Dental Schools." I saw last year the collection of specimens referred to, and was so much impressed with the interest of that collection that I begged Dr. Cryer to bring it here to this Congress. He has brought two trunks full of preparations, specimens of all sorts, and lantern slides. As we have no facilities here for a large assembly and as we have no lantern slides here, the lecture of Dr. Cryer will take place at 11 to-morrow at the dental department of the Facultad de Medicina.

Dr. G. V. I. BROWN, Milwaukee. I take much pleasure in speaking of Dr. Brophy's paper. We have heard to-day papers from two Americans we are proud of in regard to their achievements. It seems to me almost unnecessary to discuss Dr. Brophy's paper, which has been so fully and carefully covered. It is not a question of whether the thing can be done or not; it has been done and is being done successfully. Dr. Cryer has done more for this kind of surgery than has any other living man. He has made possible many operations hitherto impossible. It is most fortunate that Brophy and Cryer should be here to speak at this time. Many operations that Brophy has been doing have been questioned, and have been cleared by Cryer's work and their feasibility and practicability shown. It is no doubtful statement to say that hundreds and perhaps thousands of people are being relieved now who have suffered for years owing to the want of knowledge of treatment and knowledge of anatomy which has now made relief possible. My work lies altogether in this line. I depend on the one hand on Cryer and on the other on Brophy; both of them are of the greatest assistance to me.

Dr. MITCHELL. I just want to speak a few words in connection with Dr. Brophy's paper. Last winter I had the great pleasure of being present at his clinics. I then saw the practicability of this operation; and if anything were wanting to demonstrate the necessity and practicability of this operation and induce oral surgeons and medical men to advise their patients to undergo it, they need only see such men as Dr. Brophy operating on affections in connection with the superior and inferior maxillary bones. So many unseemly scars which disfigure the face when these operations have been made by the ordinary surgeon would, I think, be avoided were Dr. Brophy's method better known. The trouble is, surgeons have not had dentists or oral surgeons to teach them. I think it should be imperative in every medical college that, in regard to operations about the face or mouth, the general surgeon should be taught by the oral.

Dr. ROBINSON. I should like to ask Dr. Brophy whether his manner of penetrating the antrum from the canine fossa is to obtain what we call a radical cure, and whether it is not better to differentiate the two systems thus: penetration through the alveolus of the second molar for ordinary treatment of empyema of the antrum, and penetration through a large opening at the canine fossa for radical cure.

Dr. WEISER. From the standpoint which we have in Austria I find as does Dr. Brown. There are many ways to get to Rome. In many cases it is difficult to enter the antrum from the canine fossa, while there is a certain point by which in nearly all cases one is sure to enter the antrum, *i.e.* through the crista alveolaris. Opening the antrum from the canine fossa has some good points, for one thereby saves the tooth, and it is easier to make a radical operation. But it is a question whether it is not possible in all cases to make a radical operation from the second molar. I would say also, in regard to what has been said about general surgeons, that there are general surgeons who do this operation in a very fine way and perform

it through the canine fossa. I find, indeed, that general surgeons have done very much in this respect.

Dr. BROPHY. Mr. President, the paper announced for me to read this morning in the official program is upon "Surgical Landmarks," etc., but it was suggested to me that it might be better to present that paper in the Section of Surgery rather than here, and I told the secretary that I would not omit doing something in this section. So I wish to inform you that the paper I have read has been written very hurriedly since my arrival here, and in doing so that little feature of the hook form of the canal for the emergence of the inferior dental artery or vessel was omitted. You could not, of course, get in without cutting down; I am sorry I omitted to state that. I have a section of the maxillary bone here showing this anatomical arrangement and the necessity of cutting down a little so as to get a direct, straight passage into the canal. The error arose through the haste with which I prepared my paper.

Dr. Cryer's view of the innervation of the teeth is not in accord with the accepted views at the present time. The demonstrations and diagrams presented by Dr. Noyes and the beautiful specimens he has prepared show in so many cases that the plexus arrangements about the base and roots of teeth are such that these minute branches go directly in—this has been shown in so many cases that the question is pretty definitely settled, and I must state that in spite of my long and intimate relations with Dr. Cryer, his efforts to convince me, studies he has made on the subject, and his arguments have failed to convince Dr. Barrett and myself that in any instance (except in a single case) did we see a direct passage from the nerve into the foramen. He may have made very recent studies of which I am not aware which may be more convincing, but so far I have heard nothing to alter my opinion, and in all cases, with one exception, I do not find the passage of the nerve to be direct into the canal.

Dr. Schwartz's question is: How do

I make a diagnosis so as to determine the condition of bone in the antrum? By the Roentgen rays you may sometimes make these observations, but in some instances they fail. The only infallible method is to open it up, thoroughly cleanse, and take away that which needs to be removed.

As to the question of Dr. Robinson: As a general rule the only course to pursue is a large opening through the canine fossa, so as to completely cleanse out and see the antrum heal up beneath our eye. Make an opening through the canine fossa and drill slightly toward the malar process so as to make certain of having the right position, then clean out, and let it heal through the canine fossa. The mistake made is to frequently permit the opening to close up before the antrum is quite well.

The meeting then adjourned.

SATURDAY, APRIL 25TH—*Morning Session.*

This session was devoted exclusively to clinics.

Dr. A. W. HARLAN, Chicago, gave a demonstration of his method of treating pyorrhea alveolaris. He used a twenty per cent. solution of trichloroacetic acid. He sterilized the instruments in a solution composed of equal parts of resorcin, boro-glycerin, oil of gaultheria, and *eau de Botot*.

Dr. YOUNGER, Paris, also treated a case of pyorrhea alveolaris. He scaled thoroughly the root of the affected tooth, removing all deposits present. This operation lasted over an hour. A cocaine solution was employed to subdue the pain incident to such operations.

Dr. CLADERA exhibited an appliance for the extraction of teeth.

Dr. W. MITCHELL gave a clinic on the "Artistic Painting of Artificial Teeth." After painting the teeth the desired color, he fired them in a gasoline furnace. He reproduced stains as observed in the natural organs as the result of erosion and of the excessive use of tobacco.

Dr. DELAIR, Paris, showed an interesting collection of cases of facial and velo-palatal prosthesis.

Dr. MARTINIER exhibited a series of appliances for the treatment of fractures of the mandible.

Dr. AMOËDO gave a demonstration of his method of treatment and immediate filling of infected root-canals.

Dr. SUBIRANA showed the contouring forceps invented by him, also several specimens of crowns and bridges.

Dr. CASULLO exhibited pinless porcelain teeth.

Dr. TRIVIÑO showed specimens of skeleton plates.

Drs. ROBINSON and ROLLAND showed their method of administering somnoform.

Afternoon Session.

Dr. M. H. CRYER read a paper on "The Practical Teaching of Anatomy in Dental Schools." (Printed in full in the November issue of the DENTAL COSMOS, at page 841.)

Discussion.

Dr. MILLER. In the first place I must say that I think we are all very much indebted to Dr. Cryer for the demonstration given us, as well as for the preparations shown to-day. Although I am not an authority on this matter, I think it is a subject of such importance that it ought not to be passed over without recognition of the services rendered to the profession. The preparations are of immense value for the study of the head and jaws; of immense value to all who are concerned with operations of the antrum, nose, etc., or even difficult extractions. I hold them to be of great importance because they show up different points on which our views have hitherto been in error. I myself am particularly indebted to Dr. Cryer for having shown me his preparations privately, and I think those who have not yet examined them ought to take a very careful look at them.

One thing I noticed in his preparations was the fact that there is always a space between the tongue and the roof of the mouth. It is interesting to know whether in a state of nature the tongue completely fills the mouth or not. The question of the relation of the tongue to the air in the mouth is of great interest. We are told by many that in a state of repose there is a partial vacuum in the mouth. When the mouth is closed the pressure is not so great inside as out, therefore the mouth remains shut, otherwise muscles would be in a continual state of tension. Dr. Cryer made preparations explaining to us how this is possible. These are all the observations I wish to make, and I again express the gratitude of all of us to Dr. Cryer.

Dr. G. V. I. BROWN. Dr. Cryer has touched upon some points in connection with the teaching of anatomy which are not to be overlooked. The purpose of teaching is to make better dental and oral surgeons for all operations in or about the mouth. Dr. Cryer, from teaching, has come to the same conclusion that I have come to from operating—that is to say, that the data given us in the various works on the subject is only useful as a beginning, to give us a general understanding of the subject, but that for the purpose of treatment these works are almost entirely useless. Dr. Cryer's idea of making sections and throwing them on a screen, so that the students gather an idea not only of the various parts, but of their relations to one another, is excellent. We want to know what we are doing when we operate. It does not matter so much whether we can describe the various parts, whether we know their names, etc.; the essential is that we know their relations to the surrounding parts, so that when operating we know where we are cutting—what the instrument is touching. When we are operating, the parts are generally covered with blood; we cannot see them, and so must be guided by feeling and a general knowledge of their positions.

Now, Dr. Cryer has not spoken of what is to me the most important part of his work. In no better way than by these

preparations and projections can you arrive at a correct idea as to what pathological alterations of the various parts would be. We do not operate ordinarily on normal conditions! The other day, in the discussion on the treatment of the antrum, it was amusing to see how the speakers, all with the best intentions in the world, were trying to find a sure and single entrance into the antrum. That you cannot do; you must judge from the parts as you find them, determine thus where is the best place, and having found it, you must enter there. Dr. Cryer's specimens, with a little study, have taught me that the essential thing for us to know is how and why these parts develop, and what influence is caused by certain structural alterations, and what these alterations would lead to. With that view in mind, with a comprehensive idea of what these parts look and feel like, one can operate with much more speed and safety than otherwise would be possible. None of the conditions he has shown us could have been operated upon by anatomical rules, because they were pathological conditions, and that is where the strong point of Dr. Cryer's work is, in my mind.

The PRESIDENT. I should like to hear if anyone has anything more to say on this matter. The collection is the most unique collection of jaws and facial bones I have ever seen, and I feel that we cannot say too much in praise of Dr. Cryer's work.

Dr. CRYER. Gentlemen, I am very much pleased with the remarks of the President, as well as with those of Drs. Miller and Brown, and I wish to emphasize that my conclusions are the result of my experience in surgical work and dissecting, as described in my communication, and not merely the outcome of teaching. I desire to thank the local management, and I hope that my endeavors will partially repay them for the trouble they have taken and the kindness they have shown me during my visit here in Spain.

Dr. N. S. JENKINS, Dresden, read a paper on "A New Porcelain Enamel for Crown and Bridge Work and Continuous

Gum." (Published in the DENTAL COSMOS for November, at page 865.)

Discussion.

Dr. HEDDY. I should like to ask the opinion of Dr. Jenkins and of the profession generally as regards making bicuspid crowns, using the porcelain fronts and fusing. It has been my very sad experience that almost every one I have made has broken. I should be delighted to hear the opinion of the company present in respect to the matter. There is another thing: Is the porcelain you have been speaking of entirely for crown and bridge work, or artificial work in general?

Dr. JENKINS. Can be used generally.

Dr. HEDDY. I should like to know if any present have had experience in bridge-work porcelain such as this: Almost all the crowns I have made have gone to pieces. I am not speaking of the Jenkins body, but the high-fusing body used up to the present time. Can this body be used for fixed bridge work? In accidents with bridges of that kind it appears difficult or impossible to repair.

Dr. PROTEOUS. I have made a great many crowns with the porcelain high-fusing bodies. I have made a great many molars entirely of porcelain, and have had no failure. I have had failures in making small bridges. I have used the S. S. White material. I have never had failures with crowns.

Dr. DETREY. I have made a great many porcelain crowns, and started first by using the platinum solder, melting with gas, but found it very difficult not to take the color away. I found it very difficult to adapt the body to the tooth-surface, so I started to use the low-fusing, and have never had any failures. I do not use Dr. Jenkins' product. I did not know whether it could be used for crowns. I would ask if the bottles of material I bought two or three years ago for enamel fillings are still fit to use, or if Dr. Jenkins has a new porcelain for that purpose, as I understand that a new porcelain came out a short time ago for bridges.

Dr. MADIN. This is a paper we can

hardly discuss; it is the production of a new material which Dr. Jenkins has brought before us. I am, however, delighted to hear of it, as I know from my experience of Dr. Jenkins' enamel fillings that it is bound to be very good. The trouble in dealing with porcelain is that there is some difficulty in the junction of the two different kinds of bodies. We in England have been using the mounting crown, but we shall be delighted if Dr. Jenkins has produced a body which will help us to overcome the difficulty already mentioned, of getting the two materials to unite.

Dr. MITCHELL. I hail with delight the announcement of this new composition, and only await with impatience an opportunity of trying it. The defect of all bodies used for bridge or crown work which can be used with the English tooth is the question of coefficient—*it is the great trouble, speaking specially of continuous gum work.* All low-fusing bodies have proved more or less friable, and we could not use pure gold when soldering without attacking the color of the tooth. It was necessary to use pure gold, for if one resorted to copper he got a green stain, and the enamel and body were discolored. With high-fusing bodies it is imperative to use a high-fusing solder. That difficulty would now be done away with, and we could have something more attractive, in the shape of pure gold soldering. I am sure that the enthusiasm and untiring energy of Dr. Jenkins have enabled him to put before us something which will prove of benefit to us in crown and bridge work, without the disadvantage which many other comparatively low-fusing bodies possess, of cracking up and breaking away from their surroundings; with this body, I believe its fine ingredients and point of coefficient will overcome such defects and help us immensely in this artistic phase of our work.

Dr. WETZEL. Does Dr. Jenkins use the electric furnace for this new body of porcelain work? I may say I never make the first bicuspid without first building it up at the back with porcelain. I use the electric furnace and Ash's

bodies, but they do not always have the right colors.

Dr. SPAULDING. Dr. Heddy asked if we had experience with bicuspid crowns. In making crowns I almost invariably use the tube tooth made by Ash. I make my cut where I consider desirable, cap, and pin into the root, using wire made to fit the Ash tooth, letting the pin come up to take on the tooth in case of accident or breakage, then it is easily repaired in the mouth. I use this material also for bridges, wherever I can do so. I hope, however, that the new porcelain enamel will prove to be sufficiently strong, and easy to combine with the porcelain, and that it may enable us to make bridges and crowns in the manner indicated, which would certainly be a very great advantage.

Dr. ROBINSON. I have been working porcelain for a very long time. When I first started I found the inconvenience Dr. Heddy spoke of in the construction of full contours of bicuspids. The body seemed to break away from the face and from the metal, to crumble up and leave the entire skeleton in the middle, with only the face left. As these teeth had been cemented on the roots it was sometimes anything but easy to get the pin out of the roots. Furthermore, being of an enthusiastic nature I described to my patients, with legitimate pride for the authors of those lovely esthetic works, the charms of the system, and, alas! it was sad to have to climb down afterward. I became rather chary, and since then have adopted the following system: Instead of building up the bicuspid to fill the contour as I did at the beginning, I build them neither as canine nor bicuspid, but a very thick canine, and I build the contour close to the palatal surface. The cutting edge is somewhat conical in shape. Since the adoption of this plan I have not had a single failure. I always used the Jenkins porcelain. I have adopted this method; I use Dr. Jenkins' enamel, but as on the lingual side I make the contour in platinum, only the triturating surface is built up in the Jenkins material.

Dr. JENKINS. No one can be so sen-

sible as I myself of the imperfections of the original porcelain enamel for inlays when applied to bridge work. As I have tried to explain in my paper, it has itself a deficiency in respect of the very excess of its virtue. It is capable of being melted to a degree of such solidity that it is so very much stronger than any other artificial teeth ever made that it would crack the teeth. When this difficulty presented itself to me in my desire to make one material applicable to all dental purposes, I found myself involved in an entirely new problem. It was necessary, while adhering to the essential principle of having a body which should melt below the melting-point of gold, to retain at the same time its density and its strength. It is quite true that the new body is not quite so strong as porcelain enamel for inlays, nor will it bear such an excessive strain as the porcelain for inlays. Of course it would be preferable if we could use the latter for every purpose, but, since that may not be, I have succeeded in developing a new porcelain enamel which has a strength already so much greater than any porcelain teeth that it will bear any strain brought upon it in any condition of mastication. You cannot ask more of a material for crown and bridge work than that two or three millimeters of thickness should bear a crushing strain of more than 1000 lbs. It will bear, in use in the mouth, a crushing strain of more than 1000 lbs. if you give it two or three millimeters of thickness and if it be properly fused.

In its use for bicuspid crowns it has (and the specimens passed around will show you this) the great advantage of flowing perfectly between the bicuspid crown and the platinum plate below, so that one may see that every single perfect bicuspid tooth can be fitted with a porcelain crown with impunity, for by its use you immensely increase the resisting power of any artificial porcelain crown. This is especially the case with English teeth. I would like to remark, though not now prepared to give the exact statistics, that I have found through my experience with the English tooth that

it can bear a prodigiously great strain. I suppose it is the practical experience of all that there are cases where you can rely only upon an English tooth to bear an excessive strain. It has been my experience, or the experience of my laboratory, that when it is necessary to grind a tooth to an unusual degree it is safer to use English rather than any other teeth.

Now, as to other crown and bridge work it seems to me it is a point of great advantage if we can use English teeth which can thus be ground to a certain thinness. If we can fortify that tooth by a porcelain which is harmonious and which unites it with a certain accuracy to its platinum base, it seems to me that it is of great advantage. The reason why high-fusing bodies are weak is not far to seek. It consists in the coarse nature of the materials employed and their imperfect manipulation. I have never worked with high-fusing bodies which did not have a certain refractoriness—which is especially annoying when you are dependent on them for great strength; and it arises, first, from the fact that no manufacturer would ever consider the question of making that material so perfect as it needs to be made for dental purposes, because of the expense. No manufacturer would ever think of such a thing as carrying out the elaborate, complicated, painstaking, and enormously expensive experiments made in my laboratory. It would not pay; why should he do it? The only way that a dental porcelain can be produced which possesses the necessary quality is by this elaborate plant and process, and it requires an enormous amount of labor. One material after another must be tested in its own special way, until gradually they are all united and treated with different flowings so that at last you have combined the greater maximum of strength and density with a capacity for complete fusing at low temperature, and only then with great care and absolute disregard of time and expense can the perfect material be obtained.

Then we come to the question of bridge work, and we need to have the material

so strong that we can depend upon its endurance not only under ordinary but under extraordinary circumstances. With this new material the danger is not that the new porcelain will break, but that the tooth will break under the strain; therefore in making bridge work we may put the load with safety upon the new material, but not on the porcelain tooth, because the tooth has never been fused—only some of its elements have been fused, and it is therefore more weakly bound together than the material we speak of. There are, of course, still particles in the porcelain enamel which cannot absolutely and completely fuse. I do not know of any way of absolutely fusing kaolin; but it can be so treated that its particles so intimately unite with the feldspar and various fluxes that it becomes practically a homogeneous mass. The blow-holes of which Dr. Mitchell has spoken and which occur so frequently in high-fusing materials, are not altogether owing to the volatilization of gold or to any defect in the materials of which the porcelain is composed. They are chiefly owing to the defective methods of smelting. When you have a material which requires a temperature above 1100° or 1200° C, you must smelt it in an oven which you cannot examine without danger to the eye. A material which melts at a sufficiently mild degree may always be under inspection, so that when the process of smelting has been completed you stop. One is very easily deceived by those materials which require this intense white heat to reduce them to something like fluid, and is very apt to carry the heat beyond the necessary point. There is no material with which I am familiar which cannot be made to blow and bubble like water if the heat goes beyond that degree which is just sufficient to cause it to gently melt. That is the true reason why one gets blow-holes, and when blow-holes or bubbles occur in porcelain work it is chiefly due to excessive heating.

Dr. MITCHELL. The bubbles I had in my mind occur in the vicinity of the pins.

Dr. JENKINS. For that reason I have

chiefly depended on a gas furnace. With a properly regulated gas furnace one can observe every stage of the process of smelting, until one knows exactly when to stop. It may be quite possible to do equally well with Hammond's furnace, but it is for so much higher degrees of heat that it is not quite practical for me.

For crown or bridge work one may use either the Richmond crown or strike up

a cap as necessary to exactly fit the root, and depend upon that fit and strong pivot in the root to hold the crown in place. It is a fact that this may be used for crown and bridge work and continuous gum. I believe and hope it will do away with that useful, but by no means esthetic or hygienic material, vulcanite, in artificial dentistry.

(To be continued.)

NEW JERSEY STATE DENTAL SOCIETY.

Thirty-third Annual Meeting.

THE thirty-third annual meeting of the New Jersey State Dental Society was called to order at 11 A.M. on Wednesday, July 15, 1903, in the Auditorium, Asbury Park, by the president, Dr. F. L. Hindle, New Brunswick.

The first order of business was the calling of the roll and the reading of minutes of the last meeting by the secretary, Dr. C. A. Meeker, Newark.

The vice-president, Dr. H. S. Sutphen, Newark, took the chair, and the president, Dr. F. L. HINDLE, delivered his annual address, an abstract of which is as follows:

PRESIDENT'S ADDRESS.

After welcoming the members and guests of the society to the thirty-fourth annual meeting, the president spoke of the past history of the society, and asked if it had made the advancement to be expected after thirty-three years of existence. He answered this question by pointing with pride to the yearly increase in attendance, the high standard which the program had attained, and the steady growth in the membership of the society.

He commended the work of the different committees, especially the Essay Committee for the splendid literary pro-

gram presented, and the Clinic Committee for their efforts in securing such skilled clinicians for the occasion. He also praised the work of the Exhibit Committee, which had resulted in bringing together the largest and greatest exhibit ever held under the auspices of the society.

The speaker announced the creation of a new committee at the midwinter meeting of the society, to be known as the Building and Loan Committee, the object of which was to promote plans for securing a permanent home for the society.

He referred with pleasure to the fact that death had not invaded the ranks during the year, and, but for the unfortunate necessity of Dr. J. Allen Osmun having had to leave the state on account of ill health, the society presented unbroken ranks. He spoke with regret of Dr. Osmun's departure, and called attention to the fact that this had caused a vacancy on the State Board of Dental Examiners, which had been filled by the Governor without consulting the wish of the society. "Would it not have been better," he said, "if a special meeting of the society had been called, in order that you might have had the privilege of rec-

ommending to the Governor your choice to fill the unexpired term?" While the appointee was in every way agreeable to the society, still he thought the wishes of the society should have been consulted before making the appointment.

He referred to the coming International Dental Congress to be held in St. Louis in August 1904, and said that it was desirable that as large a representation as possible from New Jersey be present during that congress.

He made several valuable recommendations to the society, the most important of which was "That an interchange of license be thoroughly considered by our board, with the hope of establishing such a custom between states, if the same can be accomplished with justice to all. I believe that an arrangement by which a practitioner of, say five years' continuous practice in one state would be allowed to practice in another state without being compelled to undergo an examination would be fair and just."

In closing, the president extended the privileges of the floor to the members and guests present, and asked that the support and co-operation of the members of the society be given him in presiding over the deliberations of the body.

Discussion.

Dr. C. S. STOCKTON, Newark, in opening the discussion, said he had not intended discussing the president's address, and would not but for the fact that one portion of it referred particularly to him, he being the member appointed to fill the vacancy created by the resignation of Dr. Osmun. He thought the president was rather hasty in criticizing the action of the Governor, as the law very plainly stated that it belonged exclusively to the governor to fill vacancies which occurred in this way.

With reference to an interchange of licenses, he said he looked forward with pleasure to the time when such an arrangement could be reached by the different states. He said Dr. Ottolengui had promulgated the idea that an amendment to the present laws could be made which would permit this, but he did not

think the plan a feasible one. Dr. Stockton's idea is to promote an agreement between the boards by which a reputable practitioner who had been practicing in a certain state for five or more years could apply to his state board for a certificate to that effect, said certificate being presented to the board of the state in which he desired to locate, and the issuing of a license on the strength of this certificate.

Dr. R. OTTOLENGUI, New York, said that Dr. Stockton had called attention to a scheme which he himself had advocated, but which Dr. Stockton did not then think feasible. Dr. Stockton had, however, proceeded to outline the same scheme that he (Dr. Ottolengui) had advocated all along. He was willing, however, to give Dr. Stockton all the credit of origination if it could only be carried out, but he still contended that interchange could not be effected in the manner outlined unless it was sanctioned by the laws of the different states.

Dr. C. A. MEEKER, Newark, commended the address very highly, and especially that portion regarding the step toward securing a permanent home for the society. He said the advantage of such a home was shown by the increase in attendance and membership since they had discontinued going to a different place each year.

Dr. HINDLE, in closing, said he thought he had been misunderstood in one portion of his address. He did not mean that a discourtesy was shown in the appointment of Dr. Stockton to the board, as this appointment was in every way satisfactory to all members of the society. He, however, thought it a bad precedent for the Governor to appoint a member of the board without consulting the wish of the society, as this had always been the custom, and he felt it his duty, as president, to refer to this.

The address was then referred to a committee, consisting of Drs. Meeker, Irwin, and Hawke, to consider the recommendations made in it and report thereon.

The president resumed the chair and the secretary read a communication from

the New York State Dental Society, urging co-operation in the movement to promote scientific research, by appointing a committee for this purpose to work in connection with a national committee.

On motion the communication was received, and the president was empowered to appoint such a committee.

The meeting then adjourned until 8 o'clock P.M.

Evening Session.

The meeting was called to order at 8 o'clock by the president.

After the calling of the roll the secretary, Dr. OTTO E. INGLIS, Philadelphia, read a paper (an abstract of which follows) entitled

SOME CONSIDERATIONS PERTAINING TO IMMEDIATE ROOT-FILLING.

The author explained that what he meant by immediate root-filling was, in cases of pulp-extirpation by arsenic or pressure anesthesia, or after opening into a canal containing organisms, the immediate filling of the canal, after thorough sterilization, with a material which could be easily removed if necessary.

He said that in cases of acute apical abscess the opening and sterilization of the root-canal for the purpose of operation did not bar subsequent filling from being called immediate. The placing of permanent or temporary fillings subsequent to the root-filling had nothing to do with immediate root-filling.

He called attention to the fact that some years ago he was very favorably inclined to tentative treatment in cases such as those referred to, but that after experimentation and investigation he had decided that immediate root-filling was more advantageous to both operator and patient. He did not advocate the using of a material which could not be readily removed, as he thought that in most cases it was of material advantage to have a filling in the root which could be removed if necessary. He then mentioned quite a number of materials adapted to this character of work, among them chloro-percha, gutta-

percha, temporary stopping, paraform, and forma-percha. He advocated the use of forma-percha especially in molar teeth. In speaking of this last preparation he recommended it for its antiseptic properties, the ease with which it could be manipulated, and the advantage of its ready removal in case of subsequent trouble in the canal. His method of applying this preparation was, after thorough sterilization of the canals, to warm a small portion of the preparation, a small piece of cotton being then saturated in the forma-percha and passed into the canal with a broach. This is allowed to remain in position and followed by a cone of temporary stopping, the pulpal orifice of the canal being then sealed with zinc oxychlorid.

The author then mentioned several cases in which the tentative method had been used with practically no change in the conditions, but in which the immediate root-filling method was successful. The essayist claimed that in many cases the continued tentative treatment is of little value, and that after thorough sterilization there was no reason why the immediate filling should not be successful. No harm is done if the tooth subsequently gives trouble, as the filling can be easily removed and the tooth treated as in the case of the tentative method.

Discussion.

Dr. ALONZO IRWIN, Camden, said it had been his custom to pursue the tentative method of root-filling, but from the essayist's report of cases he would try the method advocated. He thought the main advantage in the immediate root-filling was the gain of time to both operator and patient. In cases of devitalization of the pulp by arsenic and cocain he agreed with the essayist that there was no reason why the root should not be filled immediately, provided the filling was removable. He called attention to the fact that instrumentation played an important part in this work, as in all other work of the dentist.

The principal points in the essayist's method, he thought, were thorough sterilization of the canal and the perfect fill-

ing of the same from the apex to the pulp-chamber, and under these conditions he fully agreed that the method advocated would be successful.

Dr. JOHN CURRY, Philadelphia, agreed with the essayist in saying that the question of immediate root-filling was of vital importance to both the dentist and the patient. In making frequent visits to the dental office as much time was consumed in receiving the patients as in treating the teeth, and time was a very important consideration in this day. The principle the essayist stressed was thorough sterilization, and he believed that much time and trouble could be saved by filling the roots immediately, when the proper attention is paid to sterilization. He said there was danger of trouble in some cases, but in the majority of these it could be overcome by topical applications.

Dr. JOSEPH HEAD, Philadelphia, thought the paper interesting, inasmuch as it brought forward some interesting points in the treatment of root-canals. One point of especial value was in the immediate filling of root-canals where the pulp had been extirpated under cocaine. He said the value of the essayist's method in these cases was unquestionable, as the canals were not exposed to septic conditions. He thought it best, however, in these cases, to allow the canal to remain open for a day or so, so that it could be subjected to test with zinc chlorid to be assured that none of the pulp remained, and under these conditions there was no reason why the tooth should subsequently give trouble. By Dr. Inglis's method he believed that many teeth could be saved that might be lost if the tentative method were followed and an unremovable filling inserted.

Dr. INGLIS, in closing the discussion, said it was not so much the saving of time that he wished to stress, but thorough sterilization and the character of the materials used in root-filling. He believed that when the sterilization was done with a view to immediate filling it was probably carried out better than in the tentative treatment. The apical por-

tion of the canal was often subject to septic conditions which the tentative treatment would not thoroughly sterilize. He claimed that the preparation he used had the property of sterilizing any portion of the canal which was possibly not thoroughly cleaned of the pulp-filaments, his plan being to use forma-percha after sterilization, as a temporary or permanent filling as the case may turn out. In other words, if the tooth gives trouble this can be as easily removed as a tentative treatment, but if no subsequent trouble arose, it would not have to be removed. He said that after extensive tentative treatment the tooth might give trouble, and for this reason he preferred a good removable filling to an unremovable one.

Dr. E. C. KIRK, Philadelphia, next read a paper (of which the following is an abstract) entitled

THE QUESTION OF INTERSTATE RECIPROCITY IN DENTAL LICENSURE.

The essayist began by referring to the peculiar difficulties which had to be overcome by our forefathers in framing the federal constitution, as he considered a study of these conditions interesting in view of what would necessarily have to be done in the attainment of uniform dental laws which would admit of dental reciprocity. He referred to the great struggle between the "federal" and "anti-federal" parties in our formative period, and said that the same sentiment which was harbored by the anti-federalists with regard to interference with their state rights existed at present in the dental profession and would have to be overcome. This great difference of opinion was intensified in early days by the lack of easy and rapid intercommunication, and as modern improvements to facilitate this had increased, the differences between the two factions had lessened, and in spite of the inheritance that still existed among us antagonistic to any interference with our rights as citizens of the state, a broader idea of citizenship was developing, the prominent idea not being that we are citizens of a certain state,

but emphasis being specially given to the fact that we are all American citizens.

The profession of dentistry, he said, was dealing with this same problem which had agitated our forefathers. Under the rights guaranteed to each state by the national constitution of determining the educational qualifications of those who practice dentistry within its borders, each state had enacted dental laws in accordance with its own views, resulting in a heterogeneous collection of laws aiming toward the attainment of the same result, but differing in such a way as to disqualify a licensee of any other state—this diversity increasing with the enactments and amendments subsequently adopted. Fortunately, however, with this increase in confusion of the laws, the sentiment in favor of reciprocity had increased.

He then spoke of the main obstacle to be overcome, which was that the states having high standards of education refused to accept the licenses of states of lower standards, while the lower ones refused to accept licenses from the higher ones unless the recognition were reciprocal.

After discussing the many plans which had been proposed in the past, the essayist said that the only safe plan of securing interstate reciprocity was by uniformity of standard in state legislation. There were many difficulties, however, in the way of this plan, from the fact that the different states had proceeded to enact laws without consultation with other states. It was noticeable that states in the same section of the country had in most cases enacted similar laws. He thought that, accordingly, the laws in certain sections could be so adjusted as to make reciprocity among a given group of states entirely practical.

The essayist then gave the details of a plan put into operation by the Wayne County Medical Society of Michigan, which resulted in a meeting of the examining boards of several states in that section, at which an agreement of reciprocal medical legislation was reached. The plan was for those states with similar laws to adopt an interchange of license,

and for others to work in the direction of a reciprocal clause in the laws governing examination of applicants. The "Michigan plan," although it necessitated that each state law contain a reciprocal clause, was worthy of careful consideration by the dental profession, as many state dental laws already had the reciprocal clause, or else the board was given the discretionary power of granting licenses to candidates whose qualifications were satisfactory.

He called attention to the main advantages of reciprocal recognition as in the plan above referred to, namely, its moral effect when established among a group of states in stimulating a general reciprocity movement, and also the impetus it would give to improvement in state standards and dental education in general.

The essayist, in closing, referred to the many movements toward the advancement of the profession originating in New Jersey, and said it would be very appropriate for this society to initiate such a movement toward reciprocity as that started by the Michigan Medical Society, making it possible for a qualified practitioner of any state to practice dentistry wherever circumstances might place him throughout the Union.

Discussion.

Dr. R. M. SANGER, East Orange, who opened the discussion, thought the question of reciprocity was unquestionably one of the most important questions before the profession at the present time, because there were so many interests at stake. He pointed out the fact that ethics and commercialism were in opposition on this question, and for this reason he was somewhat pessimistic as to the early accomplishment of reciprocity. He felt, however, that the day would come when all interests would be united, and reciprocity would become an assured fact. He was certain it would be the best thing for the country, and what was best for the country was best for the individual; therefore he felt that an agreement along this line would some day be reached. He said New Jersey was possibly more

interested in this question than any other state, from the peculiar conditions existing there. He believed that the dental examiners could do more to bring about reciprocity than anyone else, and he entertained great hopes from the fact that they were all becoming interested in the question.

Dr. R. OTTOLENGUI, New York, regretted that the paper had taken the academic form of all discussions of this subject, namely, to point out the obstacles to reciprocity without offering any remedy for them. He called attention to the status of the dental laws as pointed out by the essayist, and said it was not the fault of the legislatures that such a diversity in the laws existed, but rather that of the dentists in each state, for it was they who had influenced this legislation—in many instances in their own personal interests.

He expressed the hope that this academic discussion of the question would cease, and a preconcerted plan be agreed upon, and all work to that end. He thought the better plan would be to agree on the most desirable form of legislation and work to have this put into effect in as many states as possible. Reciprocity would then be a fact in those states, and eventually every state could be brought into line.

He called attention to the fact that the original mission of the National Examining Board was to accomplish this, but instead they had devoted their efforts to management of the colleges, and this tended to complicate matters instead of bringing about the desired end. He believed this question was in the hands of the profession at large, and that the National Association should agree upon a certain line of action, and give the power to the delegates from different states to use their influence toward the bringing about of a uniform legislation, which would eventually result in reciprocity.

Dr. C. S. STOCKTON, Newark, mentioned the fact that lawyers could go from one state to another after being in practice for a number of years, except in New Jersey, where they have to stand an examination. The same rule also ap-

plied to the medical profession. He said the medical profession was looking to the dental profession to solve this problem of reciprocity. He referred to his remarks during the morning session, in which he had advanced a scheme to bring about a successful solution of this problem by the interchange of certificates from the different boards, issued to men who were known to be reputable practitioners and who had been in practice for five or more years. This, he believed, would be the quickest solution of the difficulty.

Dr. E. A. BRYANT, Washington, thought Dr. Kirk's plan a good one, which would be practical but for the fact that it would affect the commercial side of the profession. The same objection applied to Dr. Ottolengui's scheme. The National Board, he said, could bring about a condition of reciprocity, but by so doing they would legislate themselves out of existence, and that could never be hoped for. Work along this line would have to be done by men outside of the boards and colleges. He thought the better solution of the problem would be for the profession at large to use their influence with the men in public office, and get them to bring it before the legislatures. The public men would have to be educated to the necessity and desirability of such a law.

Dr. A. W. HARLAN, Chicago, thought the only feasible plan for reciprocity was amendment of existing laws. The different boards could exchange certificates as a matter of courtesy, but many would not do so on account of the difference in the preliminary educational requirements. He illustrated this by mentioning several cases where, when he was a member of the Illinois Board, students came from other states and applied for licenses, but whose preliminary qualifications were below the standard of the state of Illinois, and it would have been an injustice to the people of that state to have issued licenses to them without a thorough examination. He thought Dr. Kirk's idea a good one and worthy of careful consideration.

Dr. B. F. LUCKEY, Paterson, believed

Dr. Stockton's plan the most feasible of any, but he did not think there could be any reciprocity without a more uniform preliminary educational standard. He said that in the cases of New York and New Jersey, for instance, there could be no reciprocity, as New York required a high-school education as a preliminary requirement, and New Jersey did not. He said the New York Board could not accept the New Jersey requirements, and no reciprocity could exist until the laws were uniform in this respect.

Dr. KIRK, in closing, simply wished to call attention to one point which evidently had been overlooked, which was that his paper was a general dissertation on the subject, and incidentally to bring before the profession the plan which had been put into practical operation by various medical societies; the principle being to start reciprocity among those states which had similar laws, and eventually to get other states to enter into the movement and enact similar laws. He did not think it practical to attempt uniformity of law throughout the Union before starting reciprocity. The central idea, however, must be to eventually have uniformity of law, but at the start to secure reciprocity in those states in which the laws were already uniform, and in that way to get the movement on foot.

The subject was passed and the meeting adjourned until the Thursday morning session.

SECOND DAY.—*Morning Session.*

The meeting was called to order at 10 o'clock Thursday morning by the president.

Dr. A. W. HARLAN, Chicago, read a paper (an abstract of which follows) entitled

THE DRUG ASPECT OF LESIONS OF THE GUMS.

The essayist, in opening, called attention to the importance of the care of the gums, and of the necessity of caring for the slight, seemingly harmless injuries which without this care would often re-

sult in considerable injury to the gums and consequently to the teeth. He emphasized the necessity of keeping the gums in a healthy condition, and showed from their relation to the teeth that in order to keep the teeth in a healthy condition the gums must be looked after because if neglected they would become unhealthy, and constant irritation consequent to this condition would cause them to recede from the teeth, and result in the loss of the latter.

He mentioned several causes of gum lesions, among the most prominent of which were tobacco, lack of proper care of the teeth, injudicious use of tooth-picks, etc. He also claimed that many of the numerous mouth-washes on the market were very injurious both to the teeth and gums.

He did not approve of the growing custom of feeding children on the pre-digested breakfast foods. These did away with the necessity of mastication, which, however, was necessary to the health of the gums and teeth; exercise to them was as essential as to any organs in the body. He mentioned the importance of considering lesions of both local and general origin. In both cases, however, he said, when the cause is removed the gums will promptly recover. Too long a crown he mentioned as one of the frequent local causes, also too large fillings, improper occluding, and contouring of fillings. In the treatment of these lesions he mentioned several prescriptions he had used with success, and said the most important treatment was, first, that the parts be thoroughly cleansed, and second, properly disinfected; third, prompt administration of drugs to combat sepsis. That some general diseases affect the gums, the essayist said, there is no question, and a change of air, water, diet, and general surroundings are often very beneficial. Benefit is often derived from advising patients to visit summer resorts and drink healthful spring waters in large quantities. The drinking of plenty of water is very essential in many general diseases, being a good agent to assist in the elimination of the poisons from the system. Lesions re-

quiring drugs were those proceeding from the apices of the roots, sides, and surfaces of the teeth. The essayist spoke of several advantageous methods of treating lesions from local causes, and advocated the massaging of the gums with water. Some mouth-washes were beneficial in this connection, as they were good remedial agents and good germ-destroyers. He also spoke of the value of the Roentgen rays in the treatment of gum lesions, and concluded by appealing to the profession to give better instructions to their patients regarding the care of the teeth, as many mouths are neglected on account of dentists not properly instructing patients in reference to such attention.

Discussion.

Dr. R. M. SANGER, East Orange, commended the paper very highly, and especially that portion referring to the instructions of dentists to patients in the care of their teeth. He agreed fully with the essayist regarding the worthlessness of many mouth-washes. He believed that many of them did more harm than good in that the patient often, after reading the advertising matter accompanying them, feels that he has at last found a specific for all dental troubles. This impression, he said, was unfortunately often made by the dentist in prescribing the washes. The consequence of this feeling on the part of the patient led to carelessness and neglect, with consequent pathological conditions in the oral cavity.

He noted with regret the fact that as civilization advanced the dental organs seemed to deteriorate, but whether it was due to higher living or not he could not say. He believed the universal use of the predigested breakfast foods accounted for many poor teeth and anemic children. This was being somewhat counterbalanced, however, by the growing popularity of outdoor exercise. He recalled the fact that a dental chewing gum was placed on the market years ago with the special object of giving the teeth proper exercise. He agreed fully with the essayist in the value of massaging the gums, and looked forward to the day

when electricity would play an important part in the healing of such conditions as referred to by the essayist.

Dr. L. C. LEROY, New York, believed that the importance of caring for the gums as advocated by the essayist was being recognized to a greater extent than ever before. He also discouraged the use of many of the mouth-washes; he thought they were very harmful as generally used. Many, he thought, were valuable when used intelligently and according to directions given by the dentist. With regard to massaging, he believed that most anemic conditions of the gums could be overcome in this way. Dr. LeRoy especially commended that portion of the paper dealing with the habit of feeding children on predigested foods, and also spoke of the fact that many children of wealthy parents were fed on them, and not allowed to take any exercise for fear of soiling their clothing. The value of exercise, he said, was mainly from the fact that it induced free perspiration, which helped to eliminate the waste products of the body.

Dr. C. S. STOCKTON, Newark, wished to call attention to only one point mentioned by the essayist, which was to the effect that the care of the gums was as important as the care of the teeth. In this connection, he said, it had been his custom for a number of years to have the gums and teeth of patients thoroughly cleansed by an assistant before he began to operate on them. He fully agreed with the essayist as to the necessity of keeping the gums in a healthy condition.

Dr. M. L. RHEIN, New York, said he had listened to the paper with special interest, and was glad to learn that the essayist recognized pathological conditions of the oral cavity from other than local causes. He also wished to give stress to the importance of the treatment advocated by the essayist. He believed that this local prophylactic treatment of the teeth was absolutely necessary to preserve the inherent physiological condition of the tissues. He called attention to the fact that the trend of present day treatment was along the line of pro-

phylaxis, and believed if this treatment were followed properly, there would be no lesions of the gums to treat. With reference to the essayist's statement that the care of the gums was as necessary as that of the teeth, he said he would go a step farther, and say that the care of the gums was more important than that of the teeth, because if the gums were properly cared for the teeth would take care of themselves. He advocated the massaging of the gums two or three times a week by a skilled dental nurse, going over the mucous membrane to stimulate capillary circulation, and after they had been put in a healthy condition this massaging and thorough cleansing of the teeth should be kept up at regular intervals. He believed this to be of more value than all therapeutic agents.

Dr. HARLAN, in closing, said he had nothing to add to the points brought out, but wished to thank the gentlemen for the discussion of his paper.

The subject was passed and the meeting adjourned until Thursday evening.

Evening Session.

The president called the meeting to order at 8.30 o'clock, and after roll call by the secretary,

Dr. D. GENESE, Baltimore, Md., read a paper (of which the following is an abstract) on

THE TREATMENT OF FRACTURES OF THE MAXILLA.

The essayist began by saying that he would deal principally with fractures of the inferior maxilla, as his experience had been that about ninety-nine out of every hundred fractures with which the dentist has to deal are confined to this jaw. Simple fractures, he said, which occurred without the loss of teeth, could in the majority of cases be controlled by the simple interdental splints, but compound fractures involving the loss of teeth caused more or less trouble to the operator.

The essayist next called attention to the difference in the treatment of cases

seen immediately after the fracture occurred, and those which had occurred some time previous, the latter requiring a more careful and complicated treatment, as in such cases the inflammation, swelling, etc., increased the difficulties of the operation. In these cases, where the cleansing of the parts, reducing the inflammation, etc., was of such great importance, he recommended a method that he would proceed to demonstrate, which simplified this to a great extent, inasmuch as it left the parts easy of access in the after treatment.

The essayist used silver strips, several soldered together, for making a bow to extend around the arch on the lingual and labial surfaces, covering only a small area of the teeth. These, placed around the arch with silver wire run between the interstices of the teeth, held the fracture in proper place. A bandage passed under the chin and fastened over the head, in which plaster was placed, held the lower jaw in its proper position. The bandage used was one of the essayist's own make, and the plaster was mixed with a preparation called "cementine," instead of water. This preparation caused the plaster to set very slowly, and when set the cast was very much stronger than when the plaster was mixed with water.

The essayist then gave a very interesting demonstration of his method of making the cast and adjusting the bandage.

The subject was passed, and Dr. C. A. MEEKER, the secretary, read the

REPORT OF THE EXAMINING BOARD.

The question of interchange of license with New York was first dealt with by the report, attention being called to the suspension of the interchange agreement because of the fact that the New York Board had refused interchange except in cases where all the preliminary requirements of the New York Board were complied with. The report considered the comparative equality of the examinations, and expressed the opinion that the New Jersey examination was as thorough a test of ability as the New York examina-

tion, and that this interchange of license complied fully with the spirit of the law; but the New York Board had insisted on carrying out the letter of the law by demanding a preliminary requirement equivalent to a high-school diploma, and for this reason the interchange had been suspended. The propriety of making the preliminary educational requirement of the New Jersey Board equivalent to that of the New York Board was considered, but no definite conclusion had been reached.

The report mentioned the fact that there were in the state seventy-seven dentists who had not complied with the law, and urged the co-operation of all ethical dentists to force these men to comply with the law.

The creation of a council to be appointed by the board for the prosecution of these illegal practitioners was not considered practical, the only solution being for all the dentists in the state to keep up with these men and report them to the prosecuting committee.

The report concluded by mentioning several cases prosecuted, and called attention to the court having sustained the constitutionality of the state dental law. This it considered of much importance to the profession in general, and to New Jersey in particular.

The meeting then adjourned until Friday morning.

THIRD DAY.—*Morning Session.*

The Friday morning session was called to order at 10 o'clock.

The first order of business was reports of committees.

The committee appointed to consider the recommendations made in the presi-

dent's address reported favorably on the plan suggested to procure a permanent home for the society. The committee also favored the attendance of as many members to the National Association as possible.

With regard to the question of exempting dentists from jury duty, it was recommended that a committee be appointed to suggest legislation to this effect. They also recommended that the question of interchange of licenses between the states be referred to the National Board of Examiners.

ELECTION OF OFFICERS.

The report was received.

The society then proceeded to the election of officers for the ensuing year, which resulted as follows:

H. S. Sutphen, Newark, president; W. G. Chase, Princeton, vice-president; C. A. Meeker, Newark, secretary; and H. A. Hull, New Brunswick, treasurer.

W. W. Hawke, Flemington; T. S. Dunning, Paterson; C. S. Hardy, Summit; and J. E. Duffield, Camden, were elected members of the Executive Committee.

F. W. Stevens, Newark; W. Wolsey, Elizabeth; C. H. Dilts, Trenton; M. R. Brinkman, Hackensack; and W. A. Jacques, Salem, were elected members of the Membership Committee.

Dr. Alonzo Irwin, Camden, was elected to the State Board of Dental Examiners to fill the vacancy caused by the expiration of the term of Dr. F. C. Barlow, Jersey City.

A resolution was adopted indorsing the appointment of Dr. C. S. Stockton, Newark, to the State Board of Dental Examiners, to fill the vacancy created by the resignation of Dr. J. Allen Osmun.

Adjournment.

MARYLAND STATE DENTAL ASSOCIATION AND THE DISTRICT OF COLUMBIA DENTAL SOCIETY.

Annual Union Meeting.

(Continued from page 894.)

THURSDAY, MAY 21ST—*Evening Session.*

THE Thursday evening session was called to order at 8 o'clock, by Dr. Wilson.

Dr. WM. A. MILLS, Baltimore, read the following paper:

THE USE AND ABUSE OF HYPNOTICS, ANALGESICS, AND ALCOHOLICS.

Attention is called to a subject, or subjects, which should receive the most thoughtful consideration of every member of the dental profession, with the hope that they may be awakened to a greater sense of their moral responsibility, not only to their patients, but to the community at large. Many manufacturers of proprietary mixtures, having discovered that the dental practitioner's field of labor is not confined to prosthesis, have, with the usual business foresight of the wide-awake American, flooded him, like the physician, with the advertising literature and free samples of their sleep-producing and pain-obtunding products—embracing the good, bad, and indifferent, the ethical and the non-ethical—any of which may prove exceedingly harmful when not advisedly controlled and intelligently directed.

With a few exceptions all have for their foundation some by-product of coal-tar distillation. These frequently greatly depress the heart's action, and in cases of any cardiac disturbance may cause sudden death by paralysis of that organ—such being on record after the taking of a single dose. Dr. Rogers says: "The more expensive preparations contain some kind of stimulant to counteract the effect of the original drug,

such as caffein or strychnin, but in cases of weak heart the excitant may prove as deadly as its base."

One of the most serious features connected with these combinations is the reckless and indiscriminate manner in which they are distributed. Often the whole sample is given away with no other instructions than to use it according to the directions on the box or bottle; some give written orders, while others pass out only the printed forms furnished by the makers, and in no case is one word of caution found inscribed or marked upon it. If the subject of such carelessness and indifference resists all immediate ill effects, and receives any benefit, he not only becomes familiar with its name but is likely afterward to use it for conditions foreign to that for which it was originally intended, at the same time lauding it to his acquaintances for their numerous complaints.

Again, the best of them lose their potency after long use, and often produce apparently the same conditions, but more intensified, which they at first relieved, and if they have been gotten without any restriction they are again and again used in more frequent and larger doses, until the custom is firmly established.

Had many of these *habitués* been told to take morphin or chloral they would have protested "with might and main"; yet, because that which they were using had been carelessly prescribed, or praised by a friend, or advertised as harmless, they calmly submitted until they became so dependent upon it that when they wished to give it up they found it "much easier said than done." Thus an ever-lengthening chain is forged that often

leads to the "drug habit"—not to be broken except by death.

Dr. Jelleffe says: "Every analgesic and every hypnotic is dangerous, if used indiscriminately, and all patients should be emphatically warned that there is nothing they can regularly and persistently take to relieve pain or sleeplessness without doing themselves permanent injury."

Dr. Rogers says: "It is not to be expected that the patient should fully realize the danger attached to such excesses. Their one idea is to secure relief from distressing pain."

Such being the baneful history of all narcotics when not guarded—particularly those whose composition is unknown—it is the bounden duty of all to protect their patients from such seductive influences, and not by carelessness and indifference contribute to their misfortune and to the spread of the pestilence.

There can be no agreement with Dr. J. B. Mattison, when he says that "The outlook at the present time is *against drug inebriety*." This may be true as to the abuse of morphin and chloral, but the same cannot be truthfully said of the newer anodynes, such as are now being scattered from door to door by mail, by advertisements, and in some cases by being prescribed. Dr. Hynson says: "The injury done is appalling, for much of the insanity and nervous derangement prevalent is noticeably due to the drug habit, and crime is often directly traceable to its impulses."

Advice is offered that when necessity demands a sedative, only those well known be given, such as cocain, morphin, codein, trional, sulfonal, and in exceptional cases the bromids; and only then for short periods, as all agents of this character must be looked upon as necessary evils and should be stopped at the earliest possible moment. In recurrence, change the selected one to some other. In all cases keep the patient in ignorance of what he is taking, and to prevent renewals write plainly at the bottom of the recipe: *Tace! Ne repeteque!*—Be silent! Don't repeat!

As the formality of Latin and chemic

symbolism has lost much of its former mystery, so many now being able to interpret it, it is no longer the safeguard it was; so a wiser plan is to keep in the office a few selected palliatives, and when needed give them to the patient with full and discreet instructions as to their use, first effacing all signs by which they might be recognized. This will give absolute control over the remedy and no harm can possibly come to the patient.

Notice is called again to another form of patent-drug venture that is very vicious, as it is aided in many cases by stockholders who are members of the medical and dental professions. Reference is made to some of the so-called mouth-washes and liquid nerve tonics. While none of them will kill as quickly as the first-mentioned synthetics, they nevertheless possess an element of perniciousness that may lead to all their vices. The former have little, if any, remedial value, being composed principally of Cologne spirit and very aromatic oils, and they should be relegated to the darkness from which they sprang. The worst of the latter are nothing more than alluring, highly stimulating drinks in disguise, made from the kola nut or coca leaves, and should be by state law prohibited from masquerading as medicine. A few of them are useful combinations, but should be given with care, as they also contain more or less alcohol, with a very enticing taste. To regulate the quantity used by the patient, and keep the trademark secret, inscribe distinctly, below the directions, the words already mentioned. Dr. Wiley, chief of the chemical division of the Department of Agriculture, in a late report calls special attention to the great evil arising from the sale of patent medicines under misleading names or with incorrect formulæ. "In this way," he says, "it was no unusual thing for consumers to become addicted to the use of alcohol or cocain without knowing the nature of so-called tonics they had been taking."

Dr. Osler says: "To modern pharmacy we owe much, and to its methods we shall owe much more in the future, but the profession has no more insidious

foe than the large borderland pharmaceutical house. No longer an honored messmate, in this form it threatens to become a huge parasite, eating the vitals of the body medical," and he could have well added, the body national.

No fault is to be found with any worthy product, when placed ethically before the profession, but that sane men can knowingly traffic in the miseries and lives of their fellow creatures seems almost incredible; yet these are undeniable facts, and nothing short of the severest execration should be meted out to the guilty by an outraged profession and a confiding public. The public press—the friend and tutor to the masses—has frequently sounded the alarm, by publishing warnings against the *unadvised* use of nostrums, advertised or otherwise, especially those which lull to sleep or relieve pain, as menacing to both health and life; but beyond this its influence is limited. So it becomes all the more the moral duty of all members of every branch of the art of healing to continuously fight these ever-increasing iniquities, in whatever form they may appear; not only for the protection of those entrusted to their professional care, but as good citizens, for the welfare of the general public; and while guarding others, to be ever watchful lest they themselves become degenerate victims.

In conclusion, it is high time that it be demanded of the Congress of the United States that it make a statute to stamp out forever such damnable, nefarious, pseudo-medical commercialism, before our fair land is filled with a scourge far worse than the opium plague of China.

Discussion.

O. E. JANNEY, M.D., Baltimore. I realize that dentists are becoming more and more widely educated, not only in their own line of work but in the broader line of medical knowledge; thus many are taking the course in medicine to attain the degree of M.D. as well as the D.D.S., and all are educated in our colleges, at least for the first two years, in the same branches. Therefore you must

have a wider knowledge of the patients that come before you; there must be also a tendency, as I see it, to relieve those ills from which the patients suffer, just a little outside, perhaps, of those that come directly in the way of dental work. The patient comes to you with pain, neuralgia of the face, and your first thought is to relieve that pain and make the patient easy, and you draw upon your knowledge as physicians as well as your knowledge as dentists to give this relief. In many instances the relief can be afforded by operations upon the teeth, but oftentimes it is not necessary to perform these operations immediately, and you give an anesthetic preparation of some kind to relieve the pain, and in so doing you are liable to start a habit in the patient unconsciously.

The extent of a habit that may be thus formed is appalling. The giving relief to patients by the use of opium, cocain, and alcoholic preparations, is a tempting thing to do, but the results in many cases are exceedingly bad. We do not know just who the weak patients are. Of course you would not give anything knowing that it would be likely to injure them, but the result of giving that nostrum may lead to the formation of a habit with which we are all familiar. Now, unless you have studied the subject, you may be astonished at the extent of the habit of using opium, cocain, and alcoholic preparations. It seems strange that those individuals who know their danger are the ones that most often use them. Physicians, druggists, scientific men, and now a great many women, are using these preparations. There is one thing peculiar to all these preparations which relieve pain, and that is that they tend to create an appetite for the drug. It gradually in this way gets a hold on the system and the person becomes a slave to it, no matter what the drug may be so long as it relieves pain.

It is a strong habit that is thus formed, becoming so fixed in the course of time that it is almost impossible to break away from it. When a patient gets into that condition he is a sick man, and should be so considered from the patho-

logical as well as the moral aspect of the case. Dr. Berkeley of the Johns Hopkins has been making experiments along this line, and he has found that the brain-cell itself, or the filament that leads from cell to cell, is destroyed by the use of these preparations, especially alcohol. He has proved that these little filaments are destroyed and the brain becomes a mass of degenerated nerve cells, and thus they are made useless to convey and to produce impulses.

Now, in view of the danger before the profession, in view of the formation of such habits, and the wreck that comes to the health of the individuals, with the loss of character, honesty and self-respect, evidently it is the duty of our two professions to do all in our power to stop the careless use of these drugs. I would suggest in this matter that when such preparations are used they be not prescribed in such a way that the patient knows what he is taking. Whenever we so prescribe, those who believe in the use of alcohol will take advantage of the prescriptions of physicians and dentists.

While we should use our influence to lessen the employment of these preparations as much as possible as a private duty to our profession, there is a duty we owe to the public. We should use our influence in the direction of a law to be passed by the legislature that all preparations sold as medicine should have the prescription printed upon the label and sworn to by the manufacturer. If this could be done I believe it would do away with the danger that comes from the use of patented proprietary preparations, which are fascinating to the public because of the secrecy of their ingredients.

I believe that we have a still further public duty in reference to alcohol itself. Druggists are careful about how they sell poisons or remedies of the class we are considering, but the state takes a strange position in regard to alcohol. It licenses two thousand places in Baltimore to sell alcohol, while a druggist cannot sell it without a prescription. That is a strange way to proceed when we know the evil of alcohol itself. We should use all our influence toward the lessening of the sale

of alcohol, looking to final prohibition. So long as physicians prescribe and advise such preparations the public have an equal right to think they are valuable.

Dr. J. A. LIBBEY, Pittsburg. I did not hear the paper, but I heard the very able discussion of our brother of the medical profession, and it made me feel sorry that I was not prompt in my attendance to hear the paper. I agree with everything that I heard from the gentleman who has just concluded his discussion. I think mistakes are frequently made by allowing patients to know what we are prescribing, and I must also agree with him entirely in his reference to the use of alcohol.

Dr. E. P. KEECH, Baltimore. I recall one case, within the last few months, where in a case of typhoid fever in one of our hospitals the physician in charge used morphin to allay the pain, which was all right, but the physician unfortunately told the patient that he was using morphin. The patient being a trained nurse he thought it was all right to tell her. The case went on and the nurse left the hospital. She had been using it right along for several months, and when she came into my hands she was suffering from neuritis caused by the plunging of the needle into the thigh. No medicines could help her. I refused to attend her when I found that she was using morphin in comparatively large quantities, unless she would promise to help me conquer the habit. She could not; the case was too far gone. She went to several other physicians, and now she is dead from the excessive use of morphin.

Dr. H. C. THOMPSON, Washington. The paper presents to us a subject that calls for more attention from the dentist than we have been paying to it. The fact that the dentist's office is open to all classes of people makes a demand for these preparations that are advertised right and left. Further than that, the nostrums are put up in such a form as to make them attractive not only to the patients, but so as to entice dentists to prescribe them. I have no words to express horror of the curse of distributing and prescribing preparations

that have a general effect which we cannot control. Therefore, as dental surgeons and a branch of the medical profession, we should be fully pledged to do everything we can to get legislation to control the distribution and sale of these drugs.

Dr. CLARENCE GRIEVES, Baltimore. It may be of interest to hear something of this subject as given by Dr. Hynson before the American Pharmaceutical Society lately; his investigations among physicians, druggists, and the Bureau of Statistics show that while the legitimate use of cocain and morphin has not increased among physicians and surgeons, the importation of these drugs has increased—cocain 400 per cent. and morphin 500 per cent. in the last year. The newspapers report the fact that some planters in the South, in gathering their cotton, furnish the hands with a supply of a drug which contains a large proportion of cocain in order to stimulate them to do more work. It takes the place of the grog served in former years. It has become so serious in some places that Louisiana is about to take action to prohibit the use of cocain in this manner. Now, if an ignorant class of people of this kind are to handle these dangerous drugs I think it has come to a serious pass. As Dr. Janney says, it calls for combined action on our part.

Dr. MILLS (closing the discussion). The three remedies which are now most generally used and abused are the bromids, caffein, and cocain—bromids in the form of headache and neuralgia remedies; caffein and cocain in so-called nerve tonics, often sold and recommended to the general public, and some of which are dispensed at soda fountains. In addition, they are frequently compounded with more or less alcohol—and in some cases wood alcohol—and thus we can surmise the great damage done by these alone, leaving out of the list the abuse of morphin and the coal-tar products.

An authority on drug toxicology says that one of the effects of the abuse of the bromids is to cause an eruption of the skin not unlike syphilis, and often the

subject is seized with a sudden mania to kill, or commit suicide. In respect to the action of caffein, Dr. Zenete* reports three deaths from its use: "In one case death followed the ingestion of only eighteen grains taken in three days. When the autopsy was held the heart was found to be so contracted that the scalpel could scarcely penetrate it." Another case of sudden death followed the taking of forty-five grains in the course of a few days. The slow elimination of the drug explains its accumulation in the system and its consequent dangers. It is found in the urine ten to fifteen days after it has been discontinued. Of all the narcotics, not excepting alcohol, cocain is the most brutalizing. Dr. Hynson says: "How far the responsibility of the jobber and manufacturer extends [and he could have well added, the doctor] is not yet settled, but when they know they are pandering to this most unfortunate mandestroying appetite, they must indeed have seared consciences to continue to supply this unwarranted demand without protest."

On motion the subject was passed, and the society then listened to a paper from Dr. E. A. BRYANT on "Dental Societies and the Code of Ethics."

Dr. PAUL WARRINGTON EVANS of Washington then read a paper on "Office Hygiene from the Patient's Standpoint," as follows:

OFFICE HYGIENE FROM THE PATIENT'S STANDPOINT.

Owing to the great amount of attention that is now being given to the questions of hygienic conditions and asepsis, the man who, in the practice of dentistry, thoroughly considers these matters from the viewpoint of patients as they meet with them when seeking our professional services, and who acts accordingly, will establish himself much more firmly in their estimation than the man who, granting that all things else be equal—professional ability and skill, cleanliness, and conscientiousness—fails to no-

*See *Journal of the American Medical Association*, 1902.

tice and correct those things which the most desirable patients are so quick to observe and condemn. It is the tendency on the part of many to overlook the desirability of bringing into evidence these supposedly unimportant details of our daily routine work and surroundings.

We start from the supposition that we all recognize, from a medical and surgical standpoint, the necessity for cleanliness in our office, in our person, and in our instruments and mechanical adjuncts; that we are all careful to run no risk of infection, either to ourselves or to our patients, maintaining as complete asepsis as possible at all times. But, by observation, what do we find as respects the majority of the men whose professional reputations are the highest, who are sought day after day with more work than they can accept, those men who are skilful—and I wish to speak only of those who are, but who may not be any more skilful than many others—what do we see in regard to them and their surroundings? We see that no detail, no “little thing,” has escaped them; that their daily routine and surroundings are as perfect and systematic as constant attention can make them. This we cannot help observing, for it is apparent on all sides.

We must admit that there are some men of very exceptional skill and personal magnetism to whom patients continue to go notwithstanding the condition of their offices and their instruments may be far from inviting. But we are not all in that class, and therefore cannot afford to be as careless as we find them to be, if we wish to rise above mediocrity; consequently the few details that I shall mention, which have been gathered from observation in many offices, may be of some value.

We often lose valuable patients through carelessness in little things—patients we might otherwise retain through years of work. We do not always give them the proper degree of credit for being able to observe and compare as well as ourselves; therefore, if Dr. So-and-so is more careful of their comfort and peace

of mind than you are, and they go to him because of his “eternal vigilance” and your carelessness, you deserve to lose them. He is progressive; he meets the demands that the better and more desirable class of patients are now making, and you do not. His practice may increase wonderfully, yours but very slowly.

I do not wish to be understood as writing from a purely mercenary standpoint, while yet from the standpoint of business to a certain extent—for, if we are to be taught system, taught to realize that every detail of our work and our surroundings counts, and makes a part of the whole toward which we should all aim, we must be forced out of the habit of thinking that as long as our work is conscientious and good other things are of no consequence, and be brought forcibly to face the fact that neglect of these very things may result in loss, and that proper regard for all the details of our surroundings and office routine and habits will bring its certain reward.

We are not all in a position, perhaps, to have our offices, fixtures, and surroundings as we would wish, but we can all start with the proper aim and object in view, and gradually work toward them. If you have but a very poorly equipped and furnished room, yet what you have be kept scrupulously clean, neat, and as hygienic as possible; if you yourself are always neatly attired, your person cleanly, and your instruments sterile; if your patient can see and know these things, you will be making a more solid foundation upon which to build to greater heights than the man who may have a magnificently equipped office and surroundings and yet show evidence on every side of his carelessness in regard to the hygienic conditions that should exist, and whose lack of care as to personal appearance and cleanliness and system, rather than the reverse of these conditions, is observed by the patient.

A man may be careful and cleanly in his work and yet be given credit for being otherwise from the condition of his surroundings, and may fail to impress

upon his patients what he really is, while he might accomplish this by bearing constantly in mind the necessity for these little details being so in evidence as to be beyond question. The patient judges by what he or she sees and observes, not by what he or she may be told; the evidence of their own eyes is the greatest standby of our patients. When they know everything is as they would wish it to be, and that you seek their greatest comfort, they appreciate it and you are the gainer.

Office hygiene, then, from the standpoint of the patient, mainly consists of the hygienic conditions that may exist as they can see them—not as they know them to be. The necessity of the hygienic conditions that should exist being in evidence is a fact that is being more and more recognized by the most advanced men in the profession, as their offices testify.

Owing to the limited amount of time, I can only generalize the few details referred to. First, the consensus of opinion seems to favor an office that is not too much restricted in space; an office in which there is a place for everything, and everything in its place; an office that has not the cold, bleak, uninviting appearance of a hospital operating room, yet not one that is merely a comfortable, cozy lounging room with a dental chair and a cabinet thrown in as an ornament by the wall or window. It is meant to be a dental operating room, and it should be one. It should be comfortable and well furnished, yet professional and businesslike. Absolute cleanliness, tastefulness, and neatness of arrangement are necessary. The part devoted to the chair work should suggest in every detail, as far as possible, thorough hygienic conditions and up-to-date surgical cleanliness. Where one's resources allow, the most advanced, useful, and best appliances should be used. The room should be kept well ventilated and free from the odors that will surely arise if one is not extremely careful to avoid them. These odors we probably may not notice ourselves, but patients do, and they usually find them very offensive. A few care-

fully chosen flowers make a charming addition. This general condition our patients first observe. Next they notice conditions more in detail. The dentist himself comes in for his share of scrutiny. What you wear need not necessarily be costly, but you must be neatly and cleanly attired. By far too few dentists think it necessary to give the proper amount of attention to their hands and nails. If their hands are always thoroughly washed and kept as soft as possible, the nails are often neglected. This is an important detail and should be carefully attended to. The question of office coats is one upon which there is a great diversity of opinion. Expense in this regard, however, is money saved, for a soiled coat might lose a valuable patient. We sometimes find the breath of a patient disagreeable, but are we always careful to take means to prevent ours from being so? Some do; a great many do not. A frequent rinsing of the mouth with a good antiseptic will insure a sweet, wholesome breath.

Another thing that a patient is quick to observe is the cleanliness around the operating chair. He will seldom excuse the fact that everything has not been thoroughly cleaned and put in order after the operator has finished with the last patient. He observes the condition of your chair, your cuspidor, your glassware, your bracket table and accessories, and also the floor. Some men have the floor beneath their chairs and the walls surrounding it to the height of three or four feet, tiled, while the brackets, table tops in constant use as assistants, and racks are of plate glass.

The question of linen is of the greatest importance. We can hardly be too prodigal in its use, and its cleanliness and freshness must be obvious. All soiled linen, cotton, and absorbents must be immediately disposed of. Soiled linen is a most obnoxious sight to almost all patients, not to mention the hygienic side of it and the odors it may emit.

The condition of our medicine bottles must be carefully looked after. An ill-assorted and poorly kept set of bottles is open to condemnation.

It is not enough to tell our patients that we sterilize our instruments and whatever mechanical appliances come into direct contact with the mouth. We must present the positive evidence of this, and keep the instruments free from rust, bright, and well polished.

Where feasible, double sets of such things as syringes, burs, mirrors, tweezers, etc., will be found to be of assistance.

The condition of the bracket table is often open to much criticism. Many good suggestions have been written lately regarding its care. Too often it is looked upon as a filth-spot by the patient.

The value of the help derived from a competent assistant cannot be overestimated. But it is necessary that this assistant should be cleanly, thorough, and efficient. A slovenly, careless, untidy assistant is a greater detriment than none at all.

A mere suggestion as to the importance of keeping the glassware in a perfectly cleanly condition is sufficient. We would all hesitate to drink from a glass that had about it the slightest suggestion of uncleanness, though in reality it might be clean.

Distilled water is very desirable.

I come now to the matter of hand-washing. Where possible, the wash-basin should be well in view of the patient and inviting in its appearance of hygienic conditions, defying criticism. If you are careful in regard to this very necessary adjunct you should show your patients that you want them to see it. It is infinitely more desirable that the hands should be washed, cleansed, and if necessary made sterile in the presence of the patient; not behind a screen, or in an adjoining alcove.

What I have said may to some seem very unnecessary, perhaps absurd. However, I sincerely trust that no one will delude himself into thinking that he can afford to pay no attention to the details I have mentioned.

Discussion.

Dr. R. O. SADLER, Baltimore. I agree very heartily with the contents of the

paper. I think many a young man has found that, by improving the impressions the essayist has tried to create in this paper, his practice has increased. I have in mind a young man who graduated from one of our colleges about two years ago. He came to me for some suggestions as to his office fixtures, etc., and I advised him the best I knew. He spent about a thousand dollars fixing up his office. He located in a distant city and started out in grand style, with everything new, and with a very good practice from the start. It was not long, however, before he began to neglect those little details which the essayist speaks of. We as dentists have to deal mostly with women, and that is the class of patients we get our support from. They are very critical, and they see things we do not think they see. In the case of this young man he is going from bad to worse, and his practice is beginning to fall off simply from neglect of the sanitary care of his office. He is a good operator, but the ladies are withdrawing their patronage, because he is neglecting these all-important points. His office is looking dingy and unkept, and I do not think that he will be in practice more than a year or so longer.

Dr. C. W. STRANG, Bridgeport, Conn. I heartily indorse the sentiments that were expressed by the essayist, and it seems to me in enumerating the points where the dentist should be scrupulously careful we should not neglect one of them, for certainly every one that the essayist touched upon was a point to be considered as worthy of our care and attention. I do not think it matters how skilful a man may be as an operator in any particular line of work he may choose, his skill will avail him but little if he be negligent and careless in regard to the points that the essayist referred to. So far as his wearing apparel is concerned, his personal care, his hands, finger nails, instruments and chair, and everything about him, there is not one that is safe for us to neglect. The eyes of our patients are upon us always, and they see when we do not suspect that they are watching us.

My feelings have been pained at times in our own city when I have seen young men who had been out of the dental school only a few months or years, on the streets in the middle of the day smoking a cigar or a cigarette. I am not condemning the habit of smoking, but I think it is decidedly out of place for a dentist to be seen smoking in the middle of the day. If we have contracted the habit of smoking let us confine it to the proper place and time—in the evening after the day's work is done. Let us consign the use of the weed to a time when it is least obnoxious to our patients, and if then we are scrupulously careful in our ablutions, and in the cleansing of our mouth, by the next day the odor of tobacco will be eliminated from the person.

I am a stranger among you, gentlemen, and I thank you for the recognition you have given me. I hesitate to occupy further time in repetition of that which has been so well brought to your notice by the essayist.

Dr. H. F. R. SNYDER, Baltimore. It seems well that the general cleanliness of the office should not be considered simply from the standpoint of the favorable impression it makes upon the patient, but surgical cleanliness is what is to be sought after. For instance, where gas is administered, the rubber hood which covers the whole face is frequently not looked after, while in this same office there may be quite a display of white coats and napkins. I can readily see how tuberculosis could be transmitted in that manner. After the hood has been used in a case of anesthesia it should be taken off and sterilized by being placed in a weak solution of carbolic acid or some other sterilizing agent.

In regard to the hypodermic needle, more care should be exercised in caring for it than is usually the case. I always place my needle in a bottle filled with alcohol, with a small proportion of carbolic acid; this will sterilize the needle thoroughly, and you will always have it ready for the next patient. There is no doubt that it is necessary to look after these little points in order to save our

patients from infection. Our offices should not only be neat and clean in appearance, but surgically clean as far as possible.

Dr. FRANK L. HINDLE, New Brunswick, N. J. While I unfortunately missed hearing the paper read, one thought has come to me, while listening to the discussion, which probably the essayist might have overlooked, and that is in regard to the saliva ejector connected with the fountain spittoon. Realizing the importance of cleanliness in the office, would it not be better if we could have these saliva ejectors manufactured at a reasonable price, so that we could use a new one for each patient? This is a suggestion that I think it would be well for manufacturers to look into. We all know that in the use of the saliva ejector secretions are collected in it which are very hard to remove. I usually place them in a solution of nitric acid immediately after using, and I find this cleanses them very well, but I think it would indeed be much better if we should all use a new glass tube for each patient.

FRIDAY, MAY 22D—*Morning Session.*

The meeting was called to order at 10.30 A.M. by Dr. H. A. Wilson, president of the Maryland Society.

The first order of business for the morning session was the report from the Committee on Legislation, read by the chairman, Dr. C. M. GINGRICH, Baltimore, as follows:

REPORT ON DENTAL LEGISLATION.

It is not the intention in this report, nor will it be expected, to discuss the different laws governing practice in the several states, nor will any attempt be made to interpret law. A brief, though imperfect, review of this important subject may be of benefit to all, so that we may be able to correct errors when shown to be errors, and adopt new views as fast as they shall appear to be true ones.

There has scarcely been a subject brought before the dental profession in which there has been such universal in-

terest manifested by all classes in the profession as that of dental legislation. Those who had devoted the best energies of their lives for the elevation and advancement of dentistry recognized that the time had arrived when a higher educational standard must be established by the profession—a statute promulgated by the state that would be a common law—a common standard to be attained by all who desired to practice dentistry.

In order to give this new departure some tangible and comprehensive form to be understood by all it was decided to create a National Board of Dental Examiners to formulate and proclaim a *régime* by which it would be possible to attain this most desirable end. By the advice of said National Board of Examiners, local societies in turn formulated and presented to their state legislators for enactment *such laws as could be obtained* for regulating and restricting the practice of dentistry.

The friends of professional advance and of higher educational standards were inspired from the beginning of this movement, and with vigor and resolution urged the co-operation of all who had the best interests of the profession at heart. The response of the dentists throughout this broad land was most cordial, and we doubt whether any question was ever presented for consideration that so quickly organized and solidified the ranks as did this proposed measure. It is safe to say that the membership of local societies in many communities was doubled within a short time.

Even the charlatan and advertiser became interested, and took note of events—seeing a day of reckoning and atonement which seemed nigh at hand; that their sins had found them out, and that they would likely soon rest from their nefarious labors.

Yet amid the high and gratifying prospects for the future many difficulties arose, in framing adequate laws, and having them passed by our law-makers, who very often entirely ignored the voice of the profession, and frequently so emasculated the laws that when passed they were not effective.

The question of unifying laws in all the states has been a prolific source of discussion, and it would be a great advance could such uniform legislation be secured. Those who have been interested in dental legislation know the difficulties encountered in the work, and from the experience we have had in our own state we do not believe it would be possible to induce the legislators of all the states to pass a law that would be generally satisfactory or meet the requirements of the profession.

But there should be no good reason why, by mutual understanding between examining boards duly appointed by the state, certificates issued upon satisfactory examinations should not be recognized by all state boards. This reciprocation would simplify matters very much and often relieve esteemed and honored gentlemen from the humiliation and embarrassment of additional examination before examining boards.

The impress of net results gained for dentistry by legislative enactments cannot be overestimated. That all was accomplished that was anticipated and hoped for we do not affirm. Many had hoped that the advertising dens, dental parlors, and traveling dentists would be eliminated from the earth.

Legislation has not brought the millennium to the dentist, neither has he been transported to Elysian fields to rest from his labors. The inexorable decree from the beginning, "In the sweat of thy face shalt thou eat bread," has not been revoked. Law has never prevented crime, and law cannot, nor does it propose to make a professional gentleman. The only point gained over the unprofessional and undignified is to compel them to conform to the strict letter of the law, and by rigidly enforcing proper dental laws it will not be so convenient for men of low, commercial instincts to pass examining boards.

The fact that nearly every state in the Union has a dental law upon its statute-books proves the wisdom and necessity for such legislation. No one would gainsay the fact that the presence of examining boards has had a salutary influence

upon teachers and colleges. Since the advent of dental legislation the college curriculum has been greatly enlarged, the course extended from two to four years, and now candidates for matriculation are required to show evidence of preliminary education equivalent to a two years' course in an approved high school or its equivalent.

We wish to report progress and advance in the field of dental legislation. What is most needed is intelligent, stalwart, and courageous men to carry out the provisions of the laws as enacted, without fear or favor. Give us not on dental boards men like weathercocks that change with every wind, but men like mountains who change the winds themselves. The faithful performance of duty is the companion of honesty and honor, one of the noble virtues which links with perfection.

Discussion.

Dr. J. G. PALMER, New York. There is one part of the report that appeals to me very much, and that is the portion concerning reciprocity. The idea struck me as I listened to this report that if the National Board of Examiners, being a board of authority, would set their seal of approval upon the examination of any one state, I could see no reason why that license should not be good in any state that was a member of the National Board of Examiners. That occurs to me as the easiest way out of this: for the National Board to have the power to set their seal of approval on a license, and have that license good anywhere.

Dr. B. HOLLY SMITH, Baltimore. The gentleman knows as well as I do the folly of seeking about for a law. The first law, Love your neighbor, is enough for all of us. We should go into the National Association and get them to recommend the state boards to accept from each other as equivalent the right to practice. We do not want any law. I despise people who all the time are hunting for law. Law is not necessary when the people are good. Why don't you be good?

Dr. F. M. FINLEY, Washington. I think I can safely say that the District

of Columbia is more deeply interested in dental legislation in general than any other community. In this way we may be able to get what might be considered a good working law. We are not considered citizens of this broad land, in the sense of having any rights. We may make appeals to Congress, but they are easily miscarried. The congressmen are so easily influenced against them. We have made appeals to the National Association of Dental Examiners to come to Congress and help us. We have a law at present which permits any man who is a graduate of a reputable institution to practice without examination. Most states have a law requiring examination of graduates, so that those failing before these state boards can come to Washington to practice. We attempted at the last Congress to get a bill through requiring every man to be examined, even though he were a graduate.

It has been suggested by several that a general law could be enacted which would cover the main points of this question, but I think Dr. Donnally has conceived an idea with regard to this question which is a good one. His idea is that a standard law be passed for the District of Columbia by the influence of the different societies upon the congressmen from the different states, and then to have the law made universal, so that each state will have a similar law on this subject.

Dr. J. H. LONDON, Washington. With regard to what Dr. Finley has just spoken of, Dr. Donnally's idea was to have a law passed defining the standard of dentistry; have the National Association of Dental Examiners define the standard of dentistry; have this shaped into a law and passed by Congress for the District of Columbia. We thought if we could get Congress to pass that, we could then get legislation in the different states to the same effect, from the fact that this law was passed by Congress. This would not only help us out of the mire, but it would help the whole United States in this matter.

Dr. J. A. LIBBEY, Pittsburg. Just along the line of licenses of which Dr.

Palmer speaks, I would like to say a few words. He suggests that the National Association of Examiners is an association of authority; this is a mistake, it is merely an advisory body. It can do nothing in the way of legislation, but can only act in an advisory capacity to the different boards. It is necessary for each state to have its own legislation.

Alluding to the attempts of the states of New York, New Jersey, and Pennsylvania at reciprocity, I was one of the committee from Pennsylvania that met with a committee from New York. We met and took up the points of the law of each state, the requirements of each board, and the way the examinations were held, their methods of marking, etc. The system of examination in New York is for the board to give fifteen questions on each division, allowing the student to answer ten of them, and he is marked on the ten answered, the mark required being seventy-five per cent. Pennsylvania requires ten questions on each division, and the applicant is marked on those ten questions, and on that ground we claimed that the examination of the Pennsylvania Board was more severe than that of New York. We finally agreed on reciprocity, so far as the committees were concerned, on the ground that, New York having higher requirements for preliminary qualifications of the applicant, New York was to accept the licenses of the Pennsylvania Board conditionally, the condition being that the licensee had the necessary preliminary qualifications required by New York, which was two years of the high-school course. This was four years ago. Pennsylvania was to accept the licenses of the New York Board to be submitted to the board for approval and they to report to the Dental Council. I may say here incidentally that the State of Pennsylvania has a law which provides for this council, which has charge of this matter, and the office of the board is merely to examine the applicants, mark the papers, and turn them in to the secretary of the Dental Council. This council being state officers, with the addition of the president of the State Dental

Society, makes it entirely a state business, and the board's members are state officers appointed by the Governor, but nominated by the society. The nominee must have been in the practice of dentistry ten years, and be a member of the State Society in good standing, before he is eligible for appointment.

The New York Board accepted the report of the committees, and it was referred to the State Society, which accepted it unanimously, and we were very much encouraged, thinking that the ice was broken between two great states, and that we would soon be in position to have reciprocity with other states. The report was then referred to the Board of Regents, and the secretary of the board took exceptions to it and refused to accept the licenses of Pennsylvania on account of the fact that every school in Pennsylvania did not require the matriculant to have a two years' course in the high school, and there the matter stands to-day. We asked them to accept our licenses on condition that the applicant had the necessary qualifications, but they came back at us, and said that every college in the state must require a two years' high-school course of the matriculant before they would accept the licenses from Pennsylvania. In New Jersey the requirements were for a high-school course and reciprocity was agreed upon between them, and we were left out.

I have said this to show the necessity of every society working for organized reciprocity in the way of having our laws put upon an equal standard, and until that is done I see no hope for reciprocity. So far as the National Association is concerned they all seem to be of one mind on this question, and there is a great deal of interest shown at the meetings with regard to the work of obtaining legislation on this question. It will take considerable time to do it, and it is going to be hard work. I suppose you all realize how difficult it is to impress the politician with the necessity of such a law. I have been astonished at the resistance met, having been a member of the Legislative Committee for twelve years, and

also having had some experience in trying to get bills passed with regard to the army and navy; and in this way I have had a great deal to do with politicians. I have come in contact with some very bright men in this way, and I was astonished as to how hard it was to impress them with the necessity of the dentist having a high standard of education. The only way this will be accomplished is for every man who is interested to do all he can, using all his influence to try to educate the politicians. Until that class of people is educated to the necessity of it, I never expect to see reciprocity.

Dr. W. A. MILLS, Baltimore. I heartily agree with Dr. Smith when he says that we should always have the golden rule for our guidance. I also agree with him that we have too much dental law already, and while I am in favor of reciprocity, it seems to me hardly possible for one state to recognize the diplomas of another under present conditions. I believe we would do more good if we were to turn the influences that we have been using to get dental laws passed, and use them in trying to keep up the standard of the weak colleges. It should be taken for granted that when a state grants a charter for a college, those composing its faculty are men of known professional ability and intelligence, and when they give a diploma to any of its graduates, saying they are competent, it should be sufficient guarantee that they are so, the same diploma being acceptable in any state of the Union.

Dr. J. A. LIBBEY, Pittsburg. I am very much surprised to hear a man like Dr. Smith, who is an educator, stand up before this intelligent audience and say anything against the state boards, or against the laws. I know that a great many people have a false idea of the state boards. I will admit that a good many have laws that are not the best. In a good many states the appointment of the state board is in the hands of the governor. What does a lawyer know about our profession, and nearly all governors are lawyers. They are all politicians, and look at it from that standpoint, and the conse-

quence is that in every state which has a society in which this political element exists, it is this class who have the selection of the boards. In some of the states—for instance, Pennsylvania and New York—the boards are perfectly competent to do the work. The men on the boards are just as competent to teach dentistry as many professors in the schools, and some of them will rank ahead of some teachers. We cannot expect all teachers to be of the very highest grade, neither can we expect the same of the boards. The greatest trouble in the majority of the boards is in their political appointment. I do not believe, however, that there is any one thing that has done more to help the education of the dentist than the examining boards. Take any school, and if they gave the same line of study and lectures which they gave before the examining boards started, where would they be to-day? The schools are better to-day for having the examining boards, and every school in the country is giving better education to the students. The men now have three courses of lectures of seven months, but take us older fellows, like Dr. Palmer and myself; we had only two courses of five months each. I do not say that the examining boards did all of this, but I believe it has been a very strong factor in that direction, and we are going to stick to it until we have laws in every state which will result in an intelligent class in the profession throughout. In the state of Pennsylvania, since 1897 the average percentage of failures has been twenty-two per cent., and most of these students are from our own schools. Of course we have students from all over the country, but the majority come from our own schools and I believe Pennsylvania has just as good schools as there are in any other state. If they graduate twenty per cent. who are shown not to be competent to practice dentistry—and every man who has failed was not competent—there is necessity for law on this subject.

Dr. B. HOLLY SMITH, Baltimore. I did not say anything against the examiners. I admit that I have said things silently when I have seen some unfortu-

nate graduate, whom I had tried to train in the way he should go, turned down by these men. I did not say any discourteous word about the dental examiners, and especially I would not say anything against Dr. Libbey. I did not say anything against any individuals, but still I say that it would be easier to unravel this tangle, and make it possible to obtain uniform action in this regard, if you would do as I suggest, love your neighbor as yourself. In the National Board of Examiners you could suggest a plan by which reciprocity would be possible, and so I suggest to Dr. Libbey to do it.

Dr. J. G. PALMER, New York. There are two or three points in this discussion which appeal to me very strongly and about which I would like to speak. Dr. Libbey said the National Examining Board had no legal standing. Perhaps they have no official right to determine questions, but their moral influence is enormous, and if they would establish a

standard for each of the boards to come up to, and have that for their guide, I believe every state would do as they desired them to do.

I cannot agree with Dr. Mills in his position. I saw in the paper the morning I left where a lawyer had graduated with the very highest honors, but it would not be possible for him to practice until he had passed an examination before a committee appointed by the court, and it struck me that if the rule in a much older profession than ours is so strict, there was good reason for us to be. Each state has its own examination, its own standard, and says if applicants from other states do not come up to that standard they cannot practice. I fail to see why any one state has the right to set itself up as a guide for other states. If they would all have a standard that was acceptable to the National Board I believe the matter would be helped.

(To be continued.)

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PHILADELPHIA, DECEMBER 1903.

EDITORIAL DEPARTMENT.

A NOTABLE HISTORIC EVENT.

WE call special attention to the announcement published at page 1009 of this issue relative to the celebration on February 27, 1904, of the fiftieth anniversary of the graduation of the class of 1854 of the Philadelphia College of Dental Surgery.

The college in question was one of the pioneer institutions engaged in the education of dentists in America. It enjoyed a corporate existence for only a brief period of four or five years, its faculty resigning as a body in 1856 to form the present Pennsylvania College of Dental Surgery. During its short career it accomplished results of a high order under a faculty composed of men who were the embodiment of the best professional ideals of that period, and who by their example and teaching gave not only an upward impetus to their calling, but who did much to place it upon a high professional plane.

No better evidence of the spirit and motive of these early pioneer teachers could be asked for or given than the impress which their educational effort made upon the minds and character of these men who profited by their instruction, and who during a half-century of graduated service in dentistry have in all the advances of its science and practice not only kept abreast of the vanguard, but have in many departments led the march of progress. They have indeed increased their master's talents and been faithful to the trust committed to them by the faculty of the institution which equipped them for their life's work.

To all who are interested in the history of dentistry the forthcoming anniversary celebration will appeal strongly, for the service of these

graduates covers the greater part of the professional life-history of dentistry; and these men, still active in the work, are able to speak authoritatively of the historic events which determined our birth as an independent profession. It is an occasion for congratulation not only to them that we are still in active vital relation with the sources of authentic historic data relating to the formative period of our profession and that we can still depend upon the evidence of living experience for the verification of our historic record. We are glad to learn that on the occasion of the celebration it is proposed to issue a souvenir volume containing an authentic record of the foundation and career of the first dental college in Philadelphia, with the biographies and bibliographical data of the class of 1854, together with other interesting matters pertaining to that early period, as well as the proceedings at the anniversary celebration. The history of dentistry in America is yet to be written, and the proposed souvenir volume will be an important contribution to that end.

The personal side of the question is one which needs no elaboration. The friends of the recipients of this historic testimonial are legion, and are scattered beyond geographical limitations. All who have profited by their teachings will wish to do honor to them by meeting with them at the anniversary banquet. The movement to celebrate this golden jubilee was started several years ago, and is the spontaneous expression of the good will of the dental profession of Philadelphia toward a group of men whom they have always honored and esteemed as leaders. Appreciating the extent to which these same sentiments are shared throughout the dental profession of America and elsewhere, the invitation to participate is extended to the dental profession at large. A cordial response is confidently expected, and we trust and believe that the interesting occasion will itself be one of the notable events in dental history.

THE ARMY DENTAL CORPS.

THE report of the Surgeon-General of the Army for the year ending June 30, 1903, contains a full *exposé* of the work of the corps of dental surgeons during the period from January 1, 1902, to December 31, 1902. It embodies data of professional and scientific character of the utmost importance, including a number of statistical tables showing the prevalence of oral and dental diseases among the troops at home and in the colonies.

The number of dental surgeons in service June 30, 1902, was thirty, the limit allowed by the act of Congress approved February 2, 1901. The distribution at the close of the fiscal year ending June 30, 1903, was as follows: United States, 12; Philippine Islands, 18; total, 30.

The number of soldiers treated both at home and in the colonies

amounts to 16,102, representing about one-fifth of the mean strength of the army. The treatment of the 16,102 soldiers involved the performance of 49,483 operations, an average of 3.07 operations per man.

Regarding the prevalence of dental and oral diseases among the troops, Dr. John S. Marshall, Supervising Dental Surgeon, reaches the conclusion that it is due to excessive physical and mental strain. He has given due consideration to the important part which the teeth perform in the maintenance of the general health, and with this purpose in view has taken measures to instruct the enlisted men upon the necessity of properly caring for the teeth and mouth.

The percentage of dental diseases in the troops in Cuba and Porto Rico exceeds that of the troops in the Philippine Islands and at home, the increased percentage in Cuba and Porto Rico being due to the fact that dental diseases are there more prevalent among the native troops.

It will be, without doubt, a source of great satisfaction to all who have the welfare of the dental profession at heart to realize the amount of good work accomplished by representatives of the dental profession in the army service. They have fulfilled their duties to the satisfaction of all parties concerned, and in the words of the Surgeon-General, "their work has been of a high order and deserves commendation."

We trust that at an early day a similar organized dental service may be at the command of the navy, so that both arms of our national defense may be able to profit by the benefits of intelligent dental treatment.

THE INSTITUTE OF DENTAL PEDAGOGICS.

TEACHERS, like poets, "are born," but unlike poets they are also made. It is, however, a well-known and deplorable fact that they are neither born nor made rapidly enough or well enough to supply the existing demand for teachers of the best class.

Every administrative officer of an educational institution is contending with the difficulties of securing competent teachers to meet existing educational demands. There are many reasons advanced to account for the recognized dearth of good teachers, and it is not our present purpose to discuss that phase of the question. What we do desire to emphasize is that no organization having relation to dental education is more important in its purposes or its results than the Institute of Dental Pedagogics. The results of the deliberations of this organized body of dental teachers are twofold. First, its work tends toward harmony of method in dental education, and second—but really first in order of importance—it is a training-school for dental teachers in teaching methods by which the efficiency of the teacher is increased and the effect upon the product of the schools is such as to greatly improve the quality of their output.

The Institute is the outgrowth of a real need in our educational work, and the activities of those who are guiding the destinies of the organization and enhancing its usefulness should be sustained with a hearty good will by all who are connected with dental education. The Institute is a clearing-house for the best ideas and latest thought in regard to dental teaching. No questions of a legislative character detract from the main object of the meeting. Anyone who has to offer a practical suggestion bearing upon teaching methods is welcomed and given full opportunity to exploit his views and is sure to derive benefit from the criticism of his colleagues.

We call particular attention to the attractive program which has been provided for the Buffalo meeting, and earnestly hope that every college in the country will be represented. The meeting occurs at a date when the time can be well spared from college duties and practice, and to those who have the interests of the work at heart, it cannot fail to be an occasion of interest and professional profit.

CORRECTION.—By a typographical error in the obituary notice of Dr. Taft in our November issue, the date of his death appears as October 5th, instead of October 15th.

BIBLIOGRAPHICAL.

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY. By W. A. NEWMAN DORLAND, A.M., M.D., Assistant Obstetrician to the University of Pennsylvania Hospital, etc. Third Edition, thoroughly revised. Philadelphia, New York, and London: W. B. Saunders & Co. 1903.

This work purports to embrace all the terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, and the kindred branches of the *ars medica*. In the examination of the book we have directed our attention mainly to the terms in general use in Dentistry, as we believe that the standard of works of this class may be fairly well judged by the manner in which terms selected at random have been treated. We trust, however, that the unsatisfactory result of such a test in this case may be an excep-

tion, and that in the treatment of the strictly medical terms no such errors have crept in as are found in the author's interpretation of some of the most important dental words. We know of isolated instances in which medical men have shown utter ignorance in matters related to dentistry, but they could have been excused in view of the extensive scope of medicine and further because it would be unreasonable to expect that a general practitioner should be familiar with all the technicalities pertaining to the many specialties of the healing art. But in the work under consideration such painful errors as we have observed are almost inexcusable, in view of the comprehensive title of the book.

A dictionary should reflect the latest progress in the branch of which it treats, and should be as reasonably accurate as

any fair-minded critic could expect it to be. As instances of mistaken interpretation of dental terms, we find—

The *pericementum* is defined as “the bony layer which surrounds the fang of a tooth.” This is, of course, totally wrong, the *pericementum* being to a tooth-root what periosteum is to bone. The term “fang” is antiquated and should be omitted from scientific works.

Dentin is defined as the bone-like, brittle substance forming the main part of a tooth.” Dentin is neither bone-like nor brittle. It is a specialized, dense form of connective tissue, very much unlike bone in the arrangement of its structural elements, and not brittle, unless in dry specimens.

The description of the *dental pulp* as “the soft vascular substance in the interior of a tooth” is misleading because of its incompleteness. The application of the word substance in this connection is about as inadequate as it would be in describing the eye as a semi-solid substance in the interior of the orbit.

The same may be said of the description of the *odontoblast* as “a connective tissue cell of the kind that forms dentin,” no reference being made to their location or function before and after the tooth reaches full maturity.

The errors here mentioned detract very much from the value of the work; indeed, until their elimination in a future edition the presence of the book in a dental library would be not only useless, but harmful.

J. E.

CLINIQUE DE PROTHÈSE DENTAIRE. By Dr. P. MARTINIER. Paris: J. B. Baillière et fils.

The second edition of this work is a neat little volume containing practically all of the knowledge with which the “laboratory man” should be equipped.

The book is divided into seven chapters, embracing not only a large majority of operations within the scope of prosthetic dentistry, but orthodontia as well, as the author considers that this branch of dentistry can be reasonably included within the province of prosthetic dentistry.

Throughout the book we find evidences of the manual skill, ability, and experience of the writer in matters pertaining to dental mechanics. It should be especially gratifying to the reader to realize that the presentation of the subject is the outcome of years of laboratory experience rather than a compilation from other writings. The chapter on Orthodontia is systematically arranged and embodies the methods of many European and American specialists.

Notwithstanding, however, its superior features, the scope of usefulness of this little work among English-speaking dentists must unfortunately be very limited, as it will be restricted to those familiar with the language of the author.

J. E.

BOOKS AND PAMPHLETS RECEIVED.

Complicazione Dentaria Observata in un Caso di Ileo Tefo. “Dental Complications observed in a Case of Typhoid Fever.” By Dr. Enrico Coraini. Naples: A. Tocco. 1903.

Las Escuelas de Odontología en los Estados Unidos. “Dental Schools in the United States.” By Dr. Florestan Aguilar. Madrid: La Odontología. 1903.

Transactions of the Dental Society of the State of New York. Thirty-fifth annual meeting, held at Albany, N. Y., May 1903. Philadelphia: The S. S. White Dental Mfg. Co.

Transactions of the North Carolina Dental Society. Twenty-ninth annual session, held at Winston, N. C. Asheville, N. C.: The Hackney & Moale Co. 1903.

The American Pocket Medical Dictionary. Fourth revised edition. By W. A. Newman Dorland. Philadelphia, New York, and London: W. B. Saunders & Co. 1903.

REVIEW OF CURRENT DENTAL LITERATURE.

[*International Dental Journal*, Philadelphia, November 1903.]

W. C. BARRETT'S "LINK IN OUR PROFESSIONAL HISTORY."

Under this caption the editor of the *International* describes in detail the facts connected with the organization and work of the National Association of Dental Faculties. Inasmuch as this editorial constitutes the first published history of the Faculties Association, we reprint it here in full:

"There is a universal feeling that when a person has passed beyond this active life that criticism should cease. This feeling is not only natural, but it does honor to our common humanity. The writer not only sympathizes with this feeling, but would, with rare exceptions, let the curtain fall upon the life and acts of his friend or enemy this side the open grave. There are occasions, however, when it becomes imperative to violate this excellent rule, especially where it is to correct some important points in history, or to deal justly with individual actions.

"In the October number of the *DENTAL COSMOS*, that contained the obituary of Dr. Barrett, there appeared an article penned by him a few months before his death, and read before the New York State Dental Society in May last. This posthumous publication contains so many errors that it becomes necessary that an early answer should be made even at the risk of possibly injuring personal feelings.

"Dr. Barrett has called this a 'Link in Our Professional History,' and if the link were without flaw no objection would or could be made to the chain he forged to connect the present with the past, but unfortunately his link was not securely welded, and failed to hold his history well together.

"His account of the rise and progress of the *Independent Practitioner* is of special interest to the writer, for from that source arose the *International Dental Journal*, and it is due to Dr. Barrett and the syndicate that supported him in New York, that all honor should be given them for their unselfish work in founding and supporting a journal independent of commercial affiliations.

"This portion of the link in dental history

seems, with that which follows, to be preliminary to the main argument that Dr. Barrett and his colleagues primarily paved the way that led directly to the formation of the National Association of Dental Faculties. In order to demonstrate this he begins with what he regarded as the 'irregular graduation of certain well-known and highly esteemed practitioners who had received a diploma in course from the oldest dental college in the world, *sine curriculo* and after an examination which it was alleged was but a mere form.' Dr. Barrett had all the matter relating to this put in type to present to his colleagues at the old Delevan House at the meeting in May, 1884. His colleagues at first hesitated in regard to publishing this matter, but these objections were finally removed and it was given publicity in the journal under his charge, and of course created a sensation. It is too late a period to enter a defence of the action of the Baltimore College of Dental Surgery, nor does it come within the purview of this article, but it may be said in extenuation that this action was by no means exceptional at that time, for it was a general feeling among dental educators that some means should be devised to bring those who had been in practice from fifteen to twenty years into the professional fold, and exceptional efforts were made to accomplish this. What was done legitimately twenty or thirty years ago cannot be criticized to-day with an altogether different code of ethics.

"In view of this serious action of the Baltimore College Dr. Barrett drew up a resolution covering the main points deemed objectionable and presented this to the New York State Dental Society and it was there adopted. This resolution summoned the faculty of the Baltimore College of Dental Surgery 'to appear at the next annual meeting of that society and show cause why, for alleged irregular granting of its diplomas, the name of said college should not be stricken from the list of colleges whose degrees are recognized,' etc. It is one of the singular facts in dental history that Professor R. B. Winder, dean of that college, should have acceded to this demand. It is presumed it was done in the interest of peace, but it would be singularly out of place for a state society to attempt to deal with a dental college in this summary manner to-day.

Dr. Winder succeeded in satisfying the State Society that diplomas of the character complained of in the resolution would not in the future be granted. In view of this concession the matter was dropped. The resolution of Dr. Barrett of 1884, with the subsequent action of the State Society, were, of course, published in the *Independent Practitioner*, and, in the language of Dr. Barrett, 'they were a bombshell.' Immediately, 'A meeting of the representatives of the principal dental colleges was called to assemble in the Sturtevant House, in New York city, on Monday, August 4, 1884, and the dean of the Baltimore College of Dental Surgery was foremost in promoting and furthering its objects.' Anyone reading the foregoing statement would at once reach the conclusion that the Association of Faculties began its work in the city of New York through the influence exerted by the New York State Dental Society through its action previously narrated.

"A true account of the origin of this now somewhat celebrated association has never been correctly written out, and it seems, therefore, very necessary that this should be done now while two, at least, of those who took an active part in it are still able to give a correct history of the steps that led up to its formation. In view of the fact that no written account has heretofore been given, it is not surprising that Dr. Barrett and his colleagues cherished the conviction that the work of the State Society hurriedly influenced the dental colleges to call the initial meeting in New York the same month and the same year as that in which said society met. Had Dr. Barrett been a college man at that time he would not have been led at this late date into this serious error. He did not become a member of the Association of Faculties for some years after this, and was, therefore, not well informed of its inside and early history when the article was penned.

"The original call for the meeting held in New York city was the work of four deans of separate colleges, three in Philadelphia and one in Baltimore. This conference was called through the earnest work of Professor Winder, of Baltimore, and to his labor the association owes its origin. The motives that actuated all the said deans to agree to a conference cannot be made clear at this time, for but two are living, Drs. Garretson and Winder having passed beyond the reach of interrogation. The two left, Dr. Peirce and the writer, can state, unreservedly, that the New York State Dental Society had nothing to do with, and had no influence in, its formation; in fact, the influence of that society at

that time was confined principally to its own state; neither was Dr. Barrett's influence of much importance in dental educational matters. He did not appear in the Faculties Association until August, 1894, a whole decade after this conference was called. His work as an editor was then just beginning to be felt, and it was not altogether favorably received by the dental educators of the period.

"Long prior to the first meeting of the four deans conferences were individually held. The writer had several with Professor Winder, who came from Baltimore for the purpose, and in all these consultations the main question for discussion was the probability of uniting a sufficient number of colleges to make an association effective in controlling educational matters. They were certainly not influenced by any outside pressure. The attempt at organization had been made previously by others, and failed, hence the natural doubts that prevailed as to any success with the segregated schools. Whatever may have been the motives of each of the four deans, selfishness was not one of these. They all felt that unless there was a united effort put forth by dental colleges there could be no advance, and unless the schools progressed the general profession would remain where it had been in the past. It was therefore evident that the isolated dental schools were a menace to dental education. This conclusion was not reached suddenly, but was the result of years of experience and of earnest thought. Hence the absurdity of Dr. Barrett's conclusions that it was all the result of the work of a state society. It is true, however, that this thought and experience crystallized during the winter of 1883-84, and resulted finally in calling a meeting, as heretofore stated, of the deans of the Baltimore College of Dental Surgery and all the three Philadelphia dental schools. The conference met at the office of Dr. C. N. Peirce, Philadelphia. Those present were Dr. R. B. Winder of the Baltimore College of Dental Surgery, Dr. J. E. Garretson of the Philadelphia Dental College, Dr. C. N. Peirce of the Pennsylvania College of Dental Surgery, and James Truman of the Department of Dentistry, University of Pennsylvania. The entire subject of organization was considered. The outlook for union was not favorable, but it was concluded to test the matter, and the conference decided to call a meeting to be held at the Sturtevant House, New York city, August 4, 1884. Circulars were sent out and notices were published in the dental periodicals, and upon the day appointed the four deans were present in New York city, somewhat anxious as to the final

outcome. Several of those present were strangers to the writer, but the number exceeded our anticipations, and in itself was an encouraging beginning. The schools represented were the following:

"Baltimore College of Dental Surgery: Professors R. B. Winder and M. W. Foster.

"Boston Dental College: Professors J. A. Follett and A. N. Blodgett.

"Chicago College of Dental Surgery: Professor A. W. Harlan and Dr. F. H. Gardiner.

"Harvard University, Dental Department: Professor Thos. Fillebrown.

"Dental Department, State University of Iowa: Professor A. O. Hunt.

"New York College of Dentistry: Professors Frank Abbott and J. Bond Littig.

"Dental Department, University of Michigan: Professor J. Taft.

"Ohio College of Dental Surgery: Professor H. A. Smith.

"Pennsylvania College of Dental Surgery: Professors C. N. Peirce and Henry Leffmann.

"Philadelphia Dental College: Professors J. E. Garretson and S. H. Guilford.

"University of Pennsylvania, Dental Department: Professors James Truman and E. T. Darby.

"Letters were received from the deans of the Kansas City Dental College and the University of California, Department of Dentistry, indorsing the objects of the meeting and pledging their support to the movement. Dr. C. N. Peirce was, on motion of Dr. Foster, made temporary president, and Dr. H. A. Smith temporary secretary. A committee on permanent organization was then chosen, consisting of Professors Truman, Winder, and Taft. This committee was given a somewhat arduous task. They had no precedents to govern them. While all were familiar with constitution-making, here was an organization proposed for which laws, as usually understood, were not applicable. It became at once evident that time and experience must evolve legislation, and the committee therefore decided upon several articles as a basis of organization, and called it the Constitution, and since then only one additional article has been added. The constitution as prepared by the committee was adopted, and all present signed it with the exception of Harvard, the delegate, Dr. Fillebrown, stating he had not had the authority of the governing board to bind the university. This was, at a subsequent meeting, given, and Harvard University, Department of Dentistry, became an active member and continued such until August, 1903, when its resignation was presented and accepted.

"The following permanent officers were then elected: C. N. Peirce, president; R. B. Winder, vice-president; H. A. Smith, secretary; A. W. Harlan, treasurer. Frank Abbott, J. Taft, and James Truman were made members of the Executive Committee.

"The first business was that presented by Professor Winder, who moved that after the close of the session of 1884-85 the clause, 'in the requirements for graduation of the schools belonging to the Association accepting five years' practice as the equivalent of a first course of lectures,' be abrogated. This was amended by Professor Truman, 'That after the close of the session of 1884-85 students at the dental colleges be required to attend two full regular courses of lectures before coming up for graduation.' This was adopted with the proviso offered by Dr. Harlan, that the two courses of lectures should be taken in separate years. Thus this most discreditable measure, of five years' practice as equivalent to one session, was, at the first session of this body, relegated to deserved oblivion.

"Dr. Barrett is in error in stating that this meeting was all held at the Sturtevant House. Nearly all those present were members of the American Dental Association about to convene at Saratoga Springs, N. Y. The meeting adjourned August 4th to reconvene at Saratoga, August 5, 1884. At this place all the colleges that had signed the constitution were present. The subsequent proceedings are not of sufficient general interest to warrant quotation.

"The work of the National Association of Faculties from that time to the present, now nineteen years, has been steadily to legislate for a higher standard. Through its influence the dental colleges of this country have now reached a position where any further changes will be unnecessary, except in one particular,—that of increasing the requirements for entrance. It may take several years before the weaker schools can be brought to adopt a standard already in force in the dental departments of universities.

"In view of the fact that the organization has practically completed the work hoped for by its originators, it may be questioned whether the time has not arrived to consider the propriety of changing its character from a legislative body to one more in harmony with that of the 'Institute of Dental Pedagogics,' and perhaps unite these two organizations. Something of this kind must be accomplished in the near future, or the National Association of Dental Faculties will have ceased to be of value to dental education in this country.

"While this is true, the writer has no sympathy with the criticisms constantly aimed at this body, and more the past year than heretofore. This organization has performed a great work in molding dental educational thought, and has accomplished this amidst difficulties not understood by outsiders. That it may be equal to further changes along more advanced lines of work is the earnest wish of the writer, and that through its influence dental education during the twentieth century may progress to a position beyond the dreams of the most sanguine of the dental educators of the past fifty years.

"The following abstract of a note received from Dr. C. N. Peirce, dated October 8, 1903, fully confirms the writer's previous statements. He says:

"I am very firmly impressed with my frequent letters from Dr. Winder, and also with the fact that he spent a day and night with me in considering the necessity for the Association and the advantages to be gained from such a union of the faculties of the different schools. I had letters from Drs. Taft, H. A. Smith, and Frank Abbott on the same subject, but Dr. Barrett was not in it in any sense. Dr. Winder was more active in corresponding with the deans of the more important schools. Dr. Winder's arguments in favor of the association were numerous, but one of the strongest was the harmony that would be engendered by working for a common end as well as the improvement of the curriculum and the betterment of the schools. There was a meeting of the schools at my office in Philadelphia. I do not recall that it was the final one, but the whole subject was discussed and the feeling in favor of the meeting in New York was very decided. The meeting in New York was called soon after I had a conference with Dr. Winder, he having letters from a number of deans throughout the country, all of these being favorable to the meeting. I think I never attended, or, rather, never was one of a body of men where a singleness of purpose was more marked than at this meeting. I am sure I never did where there was less striving for position.—C. N. PEIRCE."

[*British Dental Journal*, October 15, 1903.]

EPULIS AND ITS TREATMENT FROM THE DENTAL SURGEON'S POINT OF VIEW. BY CHAS. W. GLASSINGTON.

In the majority of cases the cause of epulis can be seen in the shape of a jagged tooth or root, from wearing a badly fitting denture, or from the accumulation of tartar. The diag-

nosis, as a rule, is very simple. It is generally an irregularly shaped growth, somewhat lobulated, with a broad base, but not infrequently pedunculated. It is of the same color as the gum, but if of large size may be congested, or may become ulcerated from the irritation of opposing teeth. It may be mistaken for vascular tumor and epithelioma.

The essayist is of the opinion that this variety of neoplasms should be removed by the dental surgeon, as the operation is strictly within his province. He indicates the nature of the instruments best adapted to this purpose and describes his *modus operandi* as follows: "I first excise the tumor with a 'scoop,' then remove the tooth or teeth connected with it, and afterward, with a pair of excising forceps, cut away the alveolar border and the septum between. I remove the tumor before the teeth, because the latter not only give you something to cut upon, but, in addition, if you extract the teeth first there is considerable hemorrhage which considerably interferes with the remaining part of the operation.

In fifty cases operated upon according to the above method the author has not had a single case of recurrence, notwithstanding that in several cases the growth had been previously removed and had recurred.

[*L'Odontologie*, Paris, September 15, 1903.]

KAOLIN AS AN INVESTMENT MATERIAL. BY F. DÉRUD AND J. JARRICOT.

The authors state that they have carried on a series of experiments in view of obtaining a material for investing purposes better adapted than are those at present in use. They tried several substances, and at last came to the conclusion that of all kaolin possesses the greatest advantages. The authors felt warranted in publishing the report of which this is a *résumé*, in view of the low cost, facility of manipulation, and superiority of kaolin for the purpose stated.

[*L'Odontologie*, Paris, September 30, 1903.]

TOOTH-POWDERS. BY DR. A. ANDRÉ, DEPARTMENT OF PHARMACY, UNIVERSITY OF LYONS.

Tooth-powders are medicinal preparations which help to maintain the health of the bucco-dental structures; therefore it becomes necessary to study the characteristics of the region which they are to influence, and the nature of the disorders of which it may be the seat, in order to compound preparations

upon a scientific basis. Saliva, a fluid of complex composition, plays a very important part in the formation of tartar. The precipitation of the earthy carbonates and phosphates depends upon the alkalinity of the saliva, but as, on the other hand, the acidity of the fluid is a factor in the causation of caries, efforts should be directed toward keeping it in a neutral condition, which may be partly attained by the judicious employment of appropriate tooth-powders.

The essayist has examined a number of tooth-powders, and although in some of them he found ingredients adapted to the needs of the oral region, they were found to be in combination with incompatible substances which altered completely their chemical nature; in other preparations the proportion of astringents and caustics was too large to produce the desired effects; and lastly, some preparations were lacking in activity by reason of the inert nature of their ingredients.

A tooth-powder should possess as many as possible of the following properties: (1) It should help in the treatment of buccal affections; (2) It should help to check the sources of infection of the buccal medium; (3) It should prevent the deposition of tartar. To accomplish all of the foregoing desiderata a special type of medicament is required, and if the powder be properly prepared it will have definite therapeutic, antiseptic, and mechanical properties. Dr. André gives lists of agents of these respective groups, the following being some of the more important:

Therapeutic agents: Sulfur, arsenic, iodid, potassium iodid, sodium hyposulfite, sodium borate, ammonium chlorid, neutral lithium carbonate, silver nitrate, strontium carbonate, mercuric chlorid, mercurous and mercuric iodid, chromic acid, alum, salol, benzonaphthol, formol, salicylic acid, krameria, etc.

Antiseptic agents: Boric acid, eucalyptol, carbolic acid, creasote, thymol, aristol, naphthol, hydronaphthol, the essential oils, etc.

Abrasive agents: Tricalcic phosphate, calcium carbonate, calcined magnesia, magnesium carbonate, powdered pumice, cinchona, etc.

[*Arch. de Stomatologie*, Paris, August 1903.]

SARCOMA OF THE TONGUE. BY DR. LELEUX, LILLE.

Sarcoma of the tongue is rarely observed. The first case was described in 1867. In 1897 Dr. Berger presented a series of twenty-four observations, and Dr. Leleux has observed three new cases.

He considers traumatism an important

factor in the causation of this neoplasm. Ganglionic swelling is rarely observed, a condition supporting the argument that in tumors of this variety it is the blood and not the lymphatic system which constitutes the avenue through which the disease is spread. If lymphatic swelling occur, it is generally of inflammatory nature, as shown by microscopic examination.

The diagnosis of lingual sarcoma is of a rather complicated nature. It should not be confounded with vascular tumors, cysts, fibroma, lipoma, actinomycosis, syphilitic and tuberculous tumors, or carcinoma. In the case of pedunculated sarcoma it could be confounded with two varieties of neoplasms only, viz, carcinoma or papilloma. The evolution of sarcoma is rapid; in a few weeks the tumor attains a considerable volume. The prognosis is doubtful except in case of early surgical interference.

The author concludes his report by describing the case of a man forty-three years of age, in whom, one year after the operation for the removal of sarcoma, no signs of recurrence could be detected.

[*Correspondenzblatt für Zahnärzte*, Berlin, October 1903.]

ALOPECIA AREATA OF DENTAL ORIGIN. BY DR. MILIAN.

Dr. Milian (*Ann. de Dermat. et de Syph.*) reports an interesting case of alopecia areata, caused apparently by a carious lateral incisor. The case was that of a man aged thirty-five, on whose beard areas of alopecia appeared concomitantly with the formation of an alveolar abscess upon the right lateral incisor. The mucous membrane exhibited an herpetic eruption. The affected tooth was extracted and all the remaining carious teeth were filled *secundum artem*. Shortly afterward the herpetic eruption disappeared and the hair began to grow upon the denuded surfaces.

[*La Revue de Stomatologie*, Paris, April 1903.]

TREATMENT OF DENTAL FISTULÆ. BY DR. OVIZE.

As it becomes difficult at times to force medicaments through a dental fistula, Dr. Ovize proposes to substitute for liquid medication, antiseptic vapors. His technique is as follows: The canal is rendered aseptic, and after enlarging it is filled with zinc oxid and triformol two per cent., triturated to the proper consistence with equal parts of creasote and formol. The crown is partially filled with cement and the tooth is isolated by

means of the rubber dam. Currents of hot air are then directed against the crown and the partially filled cavity in order to vaporize the creasote and formol in the root-canal. The vapors will follow the fistulous tract and will help materially in bringing about the cure of the diseased area.

[*International Dental Journal*, Philadelphia, November 1903.]

THE ROUND VACUUM CHAMBER. BY P. B. McCULLOUGH.

In advocating the round vacuum chamber the essayist states that if the vacuum chamber were placed in a plate on the right side, midway between the median line and the ridge, the resistance to force upon the teeth would be the greatest on the left side, as the power of a lever is multiplied by its length. The farther the chamber is from the ridge the more secure is the plate against tilting. As the force applied in the molar region will be the same on either side, the middle of the chamber must be over the median line of the vault. In order that the greatest possible surface of perfect adaptation of the plate may be attained, the chamber must be as small as possible consistent with the capacity for the exhaustion of a certain volume of air. With the form of chamber having a flat side parallel with the back edge of the plate, the ingress of air is easiest and the relief of the vacuum quickest—because the edge of the chamber throughout its entire width offers an extended surface for the ingress of air in the direction

from which the vacuum is most naturally relieved. With the round chamber but one point is nearest the edge of the plate, hence the barrier to the ingress of air is more complete. The leverage on a plate is greatest in the incisal region, and as the support against tilting would be in proportion as the chamber is placed toward the back, it should be so placed, modified by the provision that its nearest point to the back edge of the plate should not be less than one-fourth to three-eighths of an inch; and further, that account is to be taken of the fact that the tissues are more sensitive in the vault than anteriorly at the rugæ, where the power of suction is greatest.

[*La Odontología*, Madrid, July 1903.]

TREATMENT OF ACUTE PULPITIS. BY N. MATTE.

After five years of experience the author reports favorably on the use of the following combination for the treatment of acute pulpitis:

R—Morphinæ sulph.,
Mentholis,
Creasotæ, ãã gr. xxx;
Acidi carbolicæ, gr. xl. M.

Sig.—Saturate a pledget of cotton in the solution and place it over exposed area.

It is claimed that the pain disappears almost instantly, thereby permitting the application of the arsenic in the process of devitalizing the pulp.

PERISCOPE.

Cleaning Saliva Tubes.—When your saliva tube becomes cloudy from any cause place a few drops of acid in it. The acid will dissolve the solid matter which causes the cloudiness.—A. W. THORNTON, *Dental Review*.

Fallacy of Condensing Gold on Gutta-Percha.—It is almost impossible to conceive of one being able to condense a metal upon an elastic substance such as gutta-percha. I would certainly wish seriously to put in my protest against the condensation of gold over an elastic gum. I do not believe any man with a good appreciation of physics could endorse that method.—C. L. HUNGERFORD, *Dental Era*.

Adrenalin Therapeutics.—Adrenalin is said to be one of the most powerful of all remedies in the treatment of chloroform syncope, administered intravenously in a dose of from three to five minims of a 1:1000 solution of the chlorid.—*Therapeutic Gazette*.

Dentistry in the Roman Republic.—Recent excavations in Rome show that dentistry was practiced many centuries ago. On the Via Rosella, which existed at the time of the old Roman republic, a cave has been opened up which disclosed a number of graves set in niches. One skeleton of a woman was found with a perfectly modeled set of teeth.—*Brit. Journ. of Dental Science*.

High-Fusing Porcelain the "Desideratum" for Continuous Gum Work.—Experience has fully demonstrated to me that only high-fusing bodies are suitable for continuous gum, crown and bridge work; and I assure you it possesses all the requirements for inlay work, on account of less shrinkage, retaining its outline as carved, and the color after it is fired.—D. O. M. LECRON, *Dental Era*.

Digestion of the Pulp.—I am not making any plea for the general use of papain in the treatment of pulps. The plea I make is that there are many tortuous, small, thin, and flat root-canals in inaccessible teeth, where it is almost impossible, even though the pulp be dead, to introduce a suitable instrument for its removal, on account of the pain it causes; this fragment may be digested completely with papain.—DR. HARLAN, *Dental Review*.

Abortive Treatment of Boils.—Gallois (*Therapie der Gegenwart*) advises for this purpose that the boil should be painted with a concentrated solution of iodine in acetone. This solvent takes up four times as much iodine as alcohol, and its use on a boil is followed by the formation of a brown scab, under which the inflammation subsides. The solution should be kept for some weeks before it is used.—*Cyclopedia of Practical Medicine*.

Radium a Germicide.—R. Pluffer (*Berl. klin. Wochenschrift*, July 13) shows that these rays are not bactericidal unless brought very close—one centimeter—to germs. The typhoid and cholera germs were experimented upon, and were either killed or markedly inhibited when exposed for forty-eight hours at the above distance. Further experiments show that it is purely germicidal and that its effects are not due to an influence upon media.—*Medical Record*.

Requisite Properties of an Investment Compound.—

First: It should set in a reasonable length of time.

Second: It should possess sufficient cohesion to retain its form when set, to withstand the handling incident to proper trimming and the removal of the wax, and to insure the firm retention in correct relation to each other of the assembled parts after the removal of the wax.

Third: It should not crumble or disintegrate under the blowpipe flame.

Fourth: It should neither expand, contract, warp, nor crack.

Fifth: It should be composed of materials that are infusible at the temperature to which it will be subjected.—JAS. H. PROTHERO, *Northwestern Dental Journal*.

Inspection of Painful Injuries under Anesthesia.—Whenever possible, resort to anesthesia for the inspection and dressing of severe injuries. It allows the surgeon to take more time, as he is not afraid of hurting the patient and hence can make a more thorough examination and apply a more efficient dressing. The elimination of pain will also do much toward preventing shock.—*Internat. Journ. of Surgery*.

Diminished Vitality through Purulent Condition of the Gum.—The prevalence of great quantities of pus exuding from around the necks of the teeth from so-called pyorrhea alveolaris is constantly depressing the patient's vitality, and the physician should recognize this diseased condition and direct his patients to a dentist competent to employ the necessary treatment indicated in individual cases.—TRUMAN W. BROPHY, *Dental Review*.

Amalgam Fillings on Cement Base.—I never put in an amalgam filling except on cement, and I never put it in except on soft cement. In an occlusal cavity it is unnecessary to pay any attention to your margins, because before you finish you can take a spoon excavator and remove all cement that may exude; and in all approximal cavities, which I never fill without the use of a matrix, it requires some practice before you will be able to insert it and not squeeze out some on your margins.—J. P. ROOR, *Dental Era*.

Is Radium an Element?—Professor Sir Wm. Ramsey, at the inauguration of the session of the University College, London, on Tuesday, October 6, delivered a lecture on "The Recent Researches which have Led to the Discovery of the Properties of the Emanations from Radium" (reported in the *Pharmaceutical Journal*). A great advance, he said, has been made since it had been manifest that helium, which already coexisted in the air, was a material constituent in these phenomena. History had shown a noteworthy development in human knowledge concerning the atmosphere. Since the beginning of what might be called the age of experimental chemistry there had been a gradual growth in the knowledge of its really complicated composition. Its existence as a mixture of oxygen and nitrogen had been a matter of everyday knowledge for nearly a century. The last few years, however, had seen the discovery of several obscure constituents, one of which (helium) was known to be an integral factor in the composition of radium. There was only one conclusion to be drawn—simply that radium could not be a true element, but a

compound of helium and some other element or elements. The perpetual discharge was thus nothing more than a gradual spontaneous decomposition. The same explanation could probably be given for the activity of uranium and thorium. These and many other observations in modern chemistry pointed more and more to the belief that in the future it would be found possible to analyze and split up into their constituents many bodies now considered to be elements.—*American Druggist*.

A New Method of Rendering Corks Impervious.—Helbing has patented a method whereby a cork could be made perfectly impervious, although defective at the start. This object has been sought in various ways.—e.g. by coating with paraffin, by covering with a solution of rubber, etc. The new method is simply to soak the cork in a solution of casein and then to harden the whole in a formalin solution. By this method the cork retains its elasticity and becomes impervious to fluids, and does not communicate its taste to the latter.—*American Druggist*.

Aseptic Absorbent Points for Drying Pulp-Canals.—A bibulous paper point fine enough and stiff enough to follow fine pulp-canals, sterilized and packed in such a manner as to permit of a few at a time being taken from the package without danger of infecting the remainder, is a time-saver very useful in removing any fluid from pulp-canals, and performs this office in such a manner as to avoid the bacterial infection of the canal which so commonly accompanies the use of a cotton-wound broach for this purpose. Also useful in applying dressings in pulp-canals (originally suggested many years ago by Dr. J. F. P. Hodson).—*Dental Review*.

Bacillus of Syphilis.—Justin de Lisle (*American Medicine*) describes a microbe which he found in all patients during the secondary manifestations of syphilis. It is agglutinated or clumped by the serum of individuals with secondary syphilis, but no reaction takes place with the serum of healthy subjects. It can be grown after having passed through a porcelain filter. The direct inoculation of animals with the blood of syphilitics during the secondary manifestations causes the production of a hard ulcer, involvement of the lymphatic glands, paraplegia, etc. Inoculations of the laboratory animals with cultures of this microbe occasion special lesions comparable to those observed in syphilitics. Cultures of this bacillus are without effect when inoculated into syphilitics—*Cyclopedia of Practical Medicine*.

Remove All the Decay from Cavities: Reasons Why.—It has been my teaching for years that I had rather expose the pulp of a tooth than to leave it covered with leathery decay, for two reasons: First, it is almost impossible to disinfect it. I know you can disinfect leathery decay, but it takes longer than many of you think. The second and greatest reason is not so much the living organism that you may leave there, or its spore, but the baneful influence of its ptomains and its leucomains. These poisonous products of bacterial action are the things that destroy pulps very often.—ELGIN MAWHINNEY, *Dental Review*.

Dentists' Fees.—The idea seems to prevail with some that just in proportion as our increased facilities enable us to do more work, they must cut prices, and by so doing make the profession in the eyes of the people a commercial institution. There would be just as much sense in a surgeon, because he has an improved instrument whereby he could perform a particular operation quicker than usual, cutting his price, or a physician his regular established fee because he is fortunate enough to have a speedy horse or an automobile whereby he can see more patients in a given length of time.—J. A. PEARSON, *Dental Summary*.

Low-Fusing Porcelain Not Suitable for Contouring Work.—I consider it impractical to attempt contour filling with an inlay body that will not stand up as carved under a high heat. Low-fusing bodies have a tendency to assume a globular form when fused frequently. Then, taking into consideration the great percentage of shrinkage—thirty-three and more per cent.—it is useless to waste words in regard to its usefulness, when we have good high-fusing bodies at our command in using which you do not have to contend with those objections. Suffice it to say that our best porcelain workers in this country advocate and use high-fusing porcelain bodies.—D. O. M. LECRON, *Dental Era*.

A Rank Term.—"Cleaning teeth" is a beastly term; it should be relegated to oblivion. Suppose a patient should apply to the otologist to have his ears "cleaned," or to the rhinologist to have his nose "cleaned," what might not happen, especially if the doctor happened to be the bigger man? But the dental patient is not to blame, and this fact should make the would-be offended dentists considerate indeed. We have advised, recommended, charged for "cleaning teeth" for a century; we have educated the patient beyond the possibility of "Lest we forget,"

and like good chickens this and kindred terms naturally come daily home to roost. In the interest of reform and the habitual use of befitting terms, let us see to it that the patient, by means of brush, powder, washes, silk and rubber bands, disposes of all the dental refuse before coming to the office, leaving for us the purely professional task of "removing salivary and other deposits," "treating mechanically and medicinally the gums," "putting teeth and conjoined parts in a healthful condition." By all means let us quickly get out of our daily vocabulary terms that best become the dental scavenger.—*Dental Office and Laboratory*.

Saliva as a Factor in the Cure of Disease.—Bergmann (*Therapie der Gegenwart*) styles the gargle therapeutic trifling and inefficient for any real purpose. He thinks, on the other hand, that saliva reaches every part of the throat, and can be made a vehicle for therapeutic application. To increase the flow of saliva he has chewing tablets, and advocates their use in dyspepsia, obesity, and edema. He has a special medicated and non-medicated tablet for each form. The alkaline saliva is especially beneficial in acid dyspepsia. In obesity and edema the accumulating saliva is expelled in large amounts, and the results are surprisingly favorable.—*Journ. Amer. Med. Association*.

Pulp = Anesthesia with Phenated Cocain and Pressure.—Grind to powder cocain hydrochlorid crystals on a glass slab with spatula, incorporating enough carbolic acid (95 per cent.) to make a thick paste. Apply this paste freely over the exposed pulp, and inject by placing beeswax (not base-plate wax) in the cavity in such a way as to bring it well over the borders of the cavity, when gentle pressure can be applied on the wax over the paste and exposure, until the patient shows signs of sensation. Then discontinue the pressure for a moment, until the surface of the pulp becomes slightly deadened, when pressure can be renewed until no sensation is produced; then the pulp is removed with little or no pain.—*Texas Dental Journal*.

Ground-Glass Mortars for Mixing Dental Alloys.—It is with combined satisfaction and regret that I write of ground-glass mortars for the making of amalgam, for with no other device have I had a tithe of the trouble I have had with these; but at the same time I can say that with no other mortars have I had anything like equal satisfaction. For perfection of amalgamation of alloy (a very important consideration, but rarely appreciated) and for ease of removal of mass from

mortar, as well as for neatness and cleanliness of all results pertaining to this work, there are no other mortars at all comparable. But, *per contra*, it is almost impossible to get a decently shaped glass mortar acceptably ground and properly annealed, and without all three of these attributes a ground-glass mortar is good for nothing.—J. FOSTER FLAGG, *Pacific Dental Gazette*.

What to Do with the Pulp in Teeth with Deep Cavities.—There is only one safe manner of procedure in teeth where the decay is so near to the pulp as to make it sensitive to thermal changes and chemical influences, and that is the devitalization and removal of the pulp. If the canals are in healthy and aseptic condition they should be filled. Partial or entire exposure of pulp requires the same procedure. Pulp-capping and pulp-mummification are mostly used in such cases, and invariably result sooner or later (usually sooner) in one of these two conditions: either overstimulation of the affected pulp, which will cause pulp-nodules, or the death of the pulp with the consequent trouble.—R. O. HIRSCHI, *Dental Era*.

"Extension for Prevention."—Briefly stated, in approximal cavities of the six anterior teeth, with healthy gingivæ, it is good dentistry to carry the gingival wall under the gum, and this wall should extend gingivolabially and gingivolingually to include the gingivo-labial and gingivo-lingual angles. This extension is made for the reason that the great abundance of clinical experience teaches that when fillings are not carried to and beyond these angles decay is most likely to recur at these points. The act of mastication separates the food at the contact-points, and the cheeks and tongue, directing the food in its excursions, mechanically cleanse these surfaces and thus the danger to those most vulnerable points is reduced to a minimum. Another important extension in this class of teeth should be incisally. This extension should be beyond the point of contact toward the incisal angle, in order to protect the incisal margin from the films that may lodge between the teeth and cause a recurrence of caries at the incisal margin. A terse sentence from Dr. Black epitomizes this condition very forcibly. He says: "If the central portion of the area be cut out, when decay has first appeared, and a filling made ever so perfectly, the conditions remaining otherwise similar, it will only be a question of time until decay will destroy the remaining portions of the unclean area immediately adjacent to the margins of the filling."—C. E. BENTLEY, *Dental Review*.

Lack of Recuperative Powers in the Teeth.—The teeth are the hardest tissues of the body; they were intended to serve the purposes of mastication, to secure distinct vocalization and to give expression and beauty to the face through life, and yet they are more subject to disease than any other tissues of the body. It is quite true, I believe, that the laity understand less about the diseases of the teeth than of other affections. It is also true that other parts of the body which have been subject to disease have recuperative powers, while a tooth that has once been attacked by decay cannot *per se* arrest this invasion, consequently the disease continues unless arrested by the dentist until the process of destruction is complete. Nature will heal a wound, but will not repair a carious tooth.—TRUMAN W. BROPHY, *Dental Review*.

Discharges from the Nose Caused by Dental Disorders.—One of the most offensive conditions which diseases of the teeth give rise to is that which is accompanied by chronic discharge from the nose. Such a discharge may be due to syphilis, lupus, necrosis of the bones or cartilages, or inflammation of the frontal and maxillary sinuses, but it is very commonly found to have its origin in a diseased tooth. A glance at the relation of the upper incisor teeth to the nasal fossa and the relation of the posterior teeth to the antrum of Highmore will immediately discover the means by which an alveolar abscess, or even a less violent inflammation of the pericemental membrane, may be communicated to the frontal and maxillary sinuses and other neighboring organs, and produce a train of symptoms difficult to distinguish from chronic nasal catarrh.—SAMUEL A. HOPKINS, *International Dental Journal*.

Syphilis Transmitted by Dental Forceps.—S. S. Cartwright, M.D. (*Medical Record*), describes the following case in which syphilis was apparently transmitted by dental forceps. In September 1897 a young lady called at my office with inflammation of the eyes. It was in the evening; I diagnosed iritis and prescribed atropin instillations, and requested her to call the next morning, which she did. I gave her a very careful examination then, and found an eruption on the skin, hair falling out, etc. The history she gave was as follows: While visiting in New York city she had two teeth in the lower jaw extracted by a dentist. This was followed in a few days by swelling, sore throat, and enlargement of the glands of the neck, especially on the side whence the teeth were ex-

tracted. There was no question in my mind that it was a case of syphilis, and that the disease commenced in the mouth from the forceps used in extracting the teeth. Treatment by mercury and iodid was successful.—*Dental Brief*.

[The symptoms of the patient, so far as they are recorded by Dr. Cartwright, while to a certain extent indicative of syphilis, are not, however, in themselves sufficient, in our opinion, to have warranted the diagnosis of syphilis. The diagnosis of this constitutional taint in the absence of accurate data as to the evolution of the primary accident becomes questionable, especially in the light of such meager and obscure symptoms as were exhibited in the case.—ED.]

Examination of Teeth with Fine Points.

—In the use of exploring instruments the fine points will find cavities, especially in fissures, not visible to the eye. It is a rule almost without exception that the dentist finds more cavities in teeth than the patient is aware of, and often, with some people, suspicion is aroused that more are being found than exist. For this reason and to have fair and clear understanding at the outset, particular pains should be taken to satisfy the patient in regard to them. It is usually a satisfaction to those even who trust the dentist implicitly to see for themselves, or feel, the obscure cavities they had not suspected. If these precautions are not taken the operator is not infrequently doubted when work is finished and itemized, for rarely can a patient tell how many teeth are being worked upon or how many cavities are filled. A cavity that is not visible at all when the tooth is wet with saliva may be plainly seen when the tooth is dried and light is reflected upon it.—R. B. TULLER, *Amer. Dental Journal*.

Carcinoma of the Mouth and its Diagnosis.—With regard to cancer of the mouth, the subject of glandular enlargement is all-important in the matter of treatment; in diagnosis it is liable to be much overrated. In fact, when the surgeon is confronted with a case of suspicious ulcer or growth on tongue or lip, he should endeavor to decide its nature irrespective of whether there are enlarged glands or not. Far too much has been made in the text-books of diagnosing epithelioma of the mouth by the presence of hard, swollen glands in the neck. To expect these enlarged glands in every case of cancer of the mouth when it first comes under care is folly; to delay operative treatment until they can be felt easily is a crime. The following considerations will prove the truth of this:

(1) Cases of lingual and buccal cancer which are really hopeful as regards permanent cure from operation are those in which free excision is resorted to before any secondary deposits have formed in the neck. It is true that remarkable successes have been obtained after removal of cancerous glands in this position, but they form a very small minority compared with the general run of failures.

(2) It is impossible for the surgeon to detect the earliest infection of the lymphatic glands by palpation, and therefore it is useless for him to say "The glands are quite free; we can afford to wait." The glands concerned are always those beneath the deep cervical fascia; they are generally overlapped by the sterno-mastoid muscle; they lie along the great vessels, whose pulsation much impedes their detection.

In treating cancer of the tongue a careful and thorough attempt to clear away all the glands in which secondary deposits may be expected to have formed should be made, quite irrespective of whether such glands have been felt beforehand or not. The time at which the first operation is done is the surgeon's opportunity; if he delays to deal with the glands until they are easily palpated, the patient's chance is practically gone.

(3) Septic, syphilitic, or tuberculous ulcers of the mouth frequently cause glandular enlargement in the neck; hence in the differential diagnosis of cancer reliance on this symptom must be entirely fallacious.—*Therapeutic Gazette*.

Avoidance of the Effects of Shrinkage in Porcelain Work.—With extensive pieces of work I make separation complete at various points, that my work may not be warped or twisted out of line. With inlays it is necessary to divide the porcelain or carve it in such a manner that it will not shrink from the matrix or warp it. Shrinkage always must be taken into consideration and allowances be made to retain the matrix or framework in the same relative position you get it from the cavity or abutments. Porcelain always shrinks toward its greatest bulk, and the danger of contraction must be overcome by separation, making a cross or hole in center of body, according to piece of work in hand. There are three stages of shrinkage in all porcelain: (1) The evaporation of moisture; (2) the small particles of porcelain closing in as fusion commences; (3) as it becomes vitrified.—D. O. M. LECRON, *Dental Era*.

Method of Inserting Cotton Dressings in Root-Canals.—The rolling of cotton upon the broach is done by first laying a few loose fibers upon the forefinger of the left hand. The broach is placed upon it, allowing a few fibers to lie beyond its end. Next, the thumb is lightly pressed upon the broach. The shank is then quickly rotated with the right thumb and forefinger, and as the cotton is rolled up, the left thumb and forefinger are used to stroke it into a symmetrical cone. If the pointed broach be used, it will be noted that there is a tendency on its part to penetrate the end of the cone of cotton. This may be obviated by slightly truncating the end of the broach with scissors. This penetration of the cotton is annoying from the fact that apical tissues are liable to be irritated and that the broach is liable to be stripped of the cotton, which crowds back upon it as it comes into friction with the canal walls. In use as a dressing carrier, the broach is constantly twisted to the right; if twisted at all. To remove cottons it may be twisted in this manner into the loose fibers until these are tightly engaged, but as a rule an old barbed broach or Donaldson cleanser is preferable for this purpose. Anyone who has used as a cotton-carrier a broach which requires a wire brush or burning off to free it will be much relieved by the adoption of this method.—OTTO E. INGLIS, *Stomatologist*.

Effects of the X Rays.—Neley (*Advanced Therapeutics*, September 1903) discusses at some length the different theories as to the mode of action of the X rays. The writer takes the ground that the minimum treatment for the destruction of the disease should be alone employed, and that the effect of X-ray treatment is destructive instead of reconstructive. Dr. Neley claims that when a cancer is killed or destroyed, which apparently is usually the case when the tissues are well and healthily browned, the X ray should cease to be used altogether, as there is danger of destroying the healthy tissue and giving the cancer a new hold upon the patient. He points out that nearly all cases promise well in the beginning, and those which do badly at some point or stage of their treatment have taken a turn for the worse, and there may be something in his theory of very vital interest to the X-ray worker. He places great stress upon the character of the X rays, and points out the fact that "It is voltage that determines the rate of vibration, and not ampèreage," but the ampèreage of the light has a great deal to do with determin-

ing the effects upon the tissue. He says that he has been able with the employment of high-vacuum tubes having a spark-gap resistance of from four to seven inches to get changes in cancers in one or two weeks, and to cure eczema with one exposure; and that he has cured an epithelioma one and one-half inches in diameter with three exposures, and considers that in these cases one or two treatments would have done the work just as well. He states that when large masses are to be removed it is best to first use the X ray or the brush discharge to get the absorbents into a healthy condition with the electric current as much as possible, and for the malignant growth to be removed with cautery or knife. He holds that, to be enabled to destroy abnormal growth, it is necessary to use machines of higher ampèreage. These heavy machines produce a current of such magnitude that it excites the tube to a voluminous discharge more quickly affecting the growth, and correspondingly we are more liable to produce burns with a soft tube on a heavy machine than on a low ampèreage machine. The more powerful the machine, the quicker the result; but it requires more skill. He thinks the low tube is not worth much for therapeutic purposes unless the anode plate becomes reddened well during the application.—J. H. E., *Treatment*.

Chemistry and Physics as Related to Medicine.—Chemistry and physics have undoubtedly shed considerable light on the nature of disease because they have afforded an insight into the working of the parts of the human machine, for it is obvious that physiology could not have advanced far without the application of physical and chemical knowledge; the phenomena of metabolism and nutrition would not have been understood as they are at the present moment had not chemical and physical researches been prosecuted with such praiseworthy energy and skill. The art of synthesis has progressed enormously, and not only has it given rise to that numerous class of bodies of pharmacological importance and known as synthetics, but it has also given us a clearer insight into the constitution of complex substances, a glimpse into their molecular architecture, and this added knowledge has to some extent explained the manner of the building up and breaking down of complex structures in the human physiology. Again, pharmacology, as it deals with the relation between the chemical composition and constitution of a substance and its physiological action, will no doubt prove to be the

basis of rational therapeutics depending upon the administration of drugs.

Chemical research permeates in many directions and not the least important direction is that in which it relates to the nature of the processes of digestion, comprising the assimilation of starches, fats, and proteids. We know broadly the chemistry of the changes by which foods are brought into a condition in which they are appropriated by the body, and we know the destiny of these food substances and their bearing upon the nature of the waste products. The action of pepsin, pancreatin, and lipase are now recognized as chemical in kind. This most interesting group of bodies—the enzymes—would appear to be unorganized entities, and their behavior falls into line with that of other chemical agents; their conduct in effecting metabolic transformations, as, for instance, the conversion of starch into sugar, appears to be due to their alternate power of giving and taking, after the manner of the oxygen-carrying substance, the hemoglobin of the blood. There seems, again, to be little doubt that the recent developments of chemical and physical research in regard to the nature of solution and of chemical reactions in solution will throw considerable light upon physiological problems and will add materially to our knowledge of the function of fluids in the human body. The theory of the dissociation of salts in solution into “ions” is calculated to place a new interpretation upon the manner in which not only the digestive juices act, but also upon the changes sustained by the blood during respiration and in the metabolic processes.—*Lancet*.

Method of Making Aluminum Plates.—With the hope that I may make this appear easier and induce some to try it, I am going to give a short sketch of my method of making aluminum plates. Having got a good plaster impression, deepen the rugæ by scraping with a spoon-excavator, then coat it with some good separating solution. Take a piece of sheet lead in size about two inches wide and ten or twelve inches long and put it around your impression so as to run your model to a thickness of two inches, which is about the thickness you want your die to be. When the plaster of your model has set and you have separated your impression from it, proceed to trim your model by scraping a little over the soft parts in the mouth, and if you want an air-chamber put it on the model with wax in such shape as you want it. I very seldom use a regular air-chamber, but usually put three or four thicknesses of tin

foil on the model over the hard ridge which we find along the center of most mouths. I then take the small end of my wax spatula and mark the outline of the plate by cutting a little groove all around the edge where the plate, when it is finished, will end. This groove is made a little deeper over the soft parts in the mouth than over the hard, and the edge chamfered off toward the center of the plate. This will make the plate fit the mouth closely all around the edge and back, and help to turn the upper edge later on. Now take wax, and wax out at nearly right angles to your model along the groove which marks the top of your plate. This also will help in turning the edge of the plate on your zinc model later on. Now with your Hawes flask, Chase's molding sand, and careful manipulation, you will find very little trouble in getting a good mold of almost any mouth, and while you are making the mold your zinc can be melting so that you can in a short time get your zinc die and two or three lead counter-dies. Where the roof of the mouth is well arched I think three counter-dies are necessary, one to swage the plate up into the arch, one to just turn it over the edge of the alveolar ridge, and one for the final swaging. We have now arrived at the most important part—the part where the most care and the exercise of the best judgment come in—and that is the annealing. Aluminum works easily, and does not require a great deal of annealing, two or three times being enough for most cases. But do not forget for a moment that success or failure, as far as durability is concerned, may depend upon whether you get your plate annealed just right or whether you let any small part of it remain in the flame too long and get overheated. To get the best results the plate should be heated gradually, evenly, and not made too hot, and allowed to cool off gradually. Do not try to cool it off quickly by dropping it in water, as you are liable in that way to spoil your plate as far as wearing qualities go. Some recommend coating the plate with oil and burning off the oil; others, too, put hardwood sawdust on the plate and heat from below until the sawdust is well browned, but do not let it take fire. It seems to me that in either of the above ways one might heat the plate more than is necessary. With a little care and practice, by passing it back and forth over the flame, you can heat it sufficiently without overheating any part. The swaging is done in the usual way, only requiring a little more care in getting up into high arches without splitting the plate.—G. O. MITCHELL, *Dental Summary*.

Influence of the Vitality of Tissues on the Toxic Effects of Anesthetics; Importance of Adrenalin Chlorid for Local Anesthesia.—The *Therapist* (July 15, 1903) publishes some important observations by Braun of Leipzig under the above title. By interruption of the blood current cocain anesthesia may be prolonged at will. In tissues deprived of blood supply, in anemic or weak persons, cocain has much more local intensity than in active hyperemic tissues and in strong people with a lively metabolism, because in the former cases vital processes, and therefore resorption, proceed much more slowly, and the substance introduced remains much longer in the same place. Thus its diffusibility is greater in the prescribed areas and the local effect is also greater.

There are three methods of artificially reducing the vitality of the tissues: (1) Interruption of blood circulation by means of segmentation of the extremities; (2) by refrigeration; (3) by local application of suprarenal extract, adrenalin chlorid. Experiments showed that—

(1) Interruption of the circulation of the blood by ligation spread the anesthetic action of cocain over a larger area than without ligation, and anesthesia not only lasts as long as the circulation is interrupted, but even for some time after removal of the india-rubber band. A lessening of toxicity is also joined with the increase of local effect and the retarded absorption.

(2) In like manner the vitality of the tissues is reduced by deprivation of heat, and the local effect of the remedies thereby intensified. This applies to local anesthesia in such degree that in refrigerated tissues the intensity-duration of the anesthetic effects of cocain, eucain, etc., is much increased, and even so far that the anesthetic action of weak solutions almost equals that of more concentrated ones. Cooling hinders or prevents the general toxic effects on the tissues.

(3) Adrenalin chlorid or suprarenal extract intensified the local anesthesia of cocain solutions, so much so that weak acted as well or better than very strong solutions without the addition. The anesthesia goes far beyond the zone of direct infiltration, and the injections interrupt the conducting power of neighboring nerve-trunks. Also the duration of anesthesia is much prolonged. Adrenalin likewise intensifies eucain anesthesia. On the other hand, tropococain lowers the angio-stenosis of adrenalin solution, so that anesthesia is hardly or not at all prolonged. Adrenalin also much reduces the general toxicity of local anesthesia.

The importance of adrenalin in local anesthesia is evident. Its addition enables us to reduce the concentration of cocain and eucain solutions, and to lessen the toxic danger while increasing the anesthetic effect.

The method of employing adrenalin is as follows: The commercial solutions (1:1000) are sterilized by boiling, and kept in a sterilized brown drop-bottle, or in a wide-mouthed bottle with drop-pipette. The solution is added just before use to the cocain or eucain solutions of 0.1 to 1 per cent., with a corresponding sodium chlorid addition of 0.8 to 0.6 per cent. If it be intended to inject a small quantity of a 1 per cent. cocain solution, and to use its intense prolonged effect, three drops of the adrenalin chlorid solution are added to 1 cc. of the cocain solution. The proportion of adrenalin addition is then about 1:10,000. This strength is useful for tooth-extraction.

When 0.1 to 0.5 per cent. cocain solutions are to be used in large quantity (10 to 50 cc.) only three drops of the adrenalin solution are added to 5 to 10 cc. solutions, and to 50 cc. cocain solution one-half cc. of adrenalin solution is added, which may be measured by a hypodermic syringe. The proportion of adrenalin chlorid contained is about 1:100,000. Three drops of a 1:1000 adrenalin solution added to a 2 per cent. eucain solution makes a useful solution. Apart from its other qualities, the power of adrenalin to contract the bloodvessels, and thus blanch the tissues, is a most important one from a surgical point of view.—W. J. M., *Treatment*.

Résumé of the Literature on the Value of the Negative Evidence obtained by Exploring the Esophagus with Sounds.—

Professor Von Bergmann of the University of Berlin (*Berl. klin. Wochenschrift*, 1896, No. 1072) reports the case of a man aged twenty-four years who one day, while drinking, swallowed his plate. For the resulting dysphagia the sound was passed on the following day and the foreign body located by the resistance encountered at a point beneath the larynx about twenty-four centimeters from the teeth. Next day the patient was again sounded by Professor Von Bergmann with a strong twelve-millimeter sound. It passed peculiarly freely into the stomach, meeting with no obstruction, so that it was concluded that the plate had passed into the stomach. The dysphagia, however, persisted, and the plate was not passed with the stools. Owing to severe pains an esophagoscopy was made four days later, and it was definitely determined that the plate lay below the larynx. All attempts at removal with the forceps failed, and an

esophagotomy was performed. The plate was found to be so tightly impacted that it had to be removed piecemeal.

Bergmann states that it is not always possible, even for the most experienced, to detect a large foreign body with the sound. The strongest twelve-millimeter sound passed through smoothly, although the foreign body was lodged in the esophagus.

Egloff (*Beiträge zur klin. Chir.*, xii, 175) reports an instance in which the failure to detect a swallowed plate by the sound proved fatal from a hemorrhage occasioned by the perforation of the esophagus. A man who had swallowed an upper plate while sleeping was examined by a physician a few hours later. The esophagus was permeable to the thickest sound; so that the physician, notwithstanding the assertions of the patient that he could feel the plate lodged in the neck, declared that it had passed into the stomach. A second physician, after exploring with the sound and with the coin-catcher, reached the same conclusion. Five days later there was a profuse hemorrhage appearing at the mouth and in the stools. In the examination on the following day Kronlein detected the plate at about the height of the clavicle, and an esophagotomy was at once performed. Death occurred some days afterward from the continued hemorrhage, which, as seen at the necropsy, had been caused by the perforation of the right inferior thyroid artery.

In a case reported by Wallace of Edinburgh (*Lancet*, i, 1894, 734), a woman swallowed her plate. A large-sized olivary esophageal bougie (No. 10) was passed into the stomach, but no resistance was encountered and no foreign body could be detected. This was done twice and the coin-catcher tried with a like result. Chloroform was then administered, and the olivary bougie again introduced, when, although it passed readily into the stomach, a slight sensation of roughness was detected, not sufficient, however, to enable one definitely to say that a foreign body was present. The coin-catcher was then introduced, and after two or three endeavors to "catch on" to the plate, if present, it caught but could not be withdrawn by a moderate degree of force. Esophagotomy and gastrotomy were then made.

Very similar to this is the case of Edmunds (*Lancet*, i, 1901, 511). A man forty-five years old had swallowed his plate. The house-surgeon felt the foreign body with the probang, but was unable to remove it. On the following day Edmunds passed a probang into the stomach without meeting with any obstruction, and a further attempt later in

the day also met with no success, so that it was thought that the plate had passed into the stomach. Two days later, while passing a stomach-tube, an obstruction was distinctly felt above the cardiac opening. Gastrotomy was done and the plate was found impacted above the cardia.

Also remarkable for the complexity in the findings on successive days is the case recently reported by Quadflieg (*Münch. med. Wochenschrift*, 1901, p. 146). A woman forty-four years old swallowed her plate, three centimeters long and three-quarters to one and a quarter wide. The result of the examination was negative, neither the sound nor the Roentgen rays being capable of locating the same. On each of the following two days the examination with the sound and the skiagraph was continued, and it was once thought that the plate was felt about thirty-eight centimeters from the teeth. On the two days following the Roentgen rays each time showed a shadow which was slightly larger than the plate swallowed, which was in the left hypochondrium, in the stomach. Laparotomy was made, but no foreign body could be felt either in the stomach or the entire intestinal tract. Gastrotomy was then undertaken, and the impacted plate was found in the esophagus slightly above the cardia.

Adelmann, *apropos* of a case in which all known diagnostic methods failed to establish the presence of a plate which actually was lodged in the pharynx, most pertinently remarks that one is not always placed in the favorable position of Dieffenbach, who, while looking at the beautiful teeth of a lady consulting him, saw them suddenly disappear and symptoms of asphyxia supervene thereon. To Langenbeck is credited a similar experience.

Among other instances in which the sound failed to detect the presence of the artificial plates which had been swallowed is the case of Bern, in which a man swallowed his denture, to which a plate corresponding to the hard palate was attached. The sound passed freely into the stomach, and word was sent to his home to thoroughly search his bed, as the patient recollected that he had coughed violently. At the second examination a few hours after, a very tender point was found, and the teeth were then also detected by the sound at the level of the cricoid cartilage. Esophagotomy was performed, and the convexity of the plate was found turned forward in the esophagus, the teeth being directed downward. In the direction of its greatest

length the plate distended the esophagus, and it was able in this position to revolve around both of its ends as upon an axis, which explained the fact that the sound in the first attempt passed freely while at the second trial it met with resistance.

Egloff also reports the instance of a woman who had swallowed a plate with two teeth. The physician upon passing a thick sound could detect no resistance, the sound passing freely into the stomach, and during its retraction no resistance was to be felt. On the following day the sound again passed freely into the stomach, meeting with no obstacle. Upon pulling it out, however, it was felt to strike against an obstacle twenty-two and one-half centimeters from the teeth. Diagnosis was then definitely established by the thickest Trousseau sound.

Dumont also mentions a case in which a man swallowed a plate with two teeth during an epileptic fit. He was immediately examined with a sound with a negative result. On the following day, however, the teeth were detected by again sounding.

Sonnenburg reports a similar experience. A man had swallowed a piece of his plate to which one tooth was attached. A thick sound passed freely into his stomach. Other attempts gave an uncertain feeling of resistance in the upper portion of the esophagus. The Roentgen rays gave no elucidation, and the diagnosis of a foreign body in the esophagus or stomach remained in doubt. Fourteen days later the esophagoscope definitely established the presence of the foreign body within the esophagus, twenty-two centimeters from the teeth.

This negative finding by the sound in the presence of such foreign bodies as artificial plates has been in special remarked upon by V. Hacker, who explains this peculiarity in that the convex surface of the plate most frequently lies in apposition to the anterior wall of the esophagus. As the probable cause of this fact it is stated that these foreign bodies during deglutition push into and follow the anterior and lateral walls of the esophagus rather than the posterior wall, which the vertebral column renders resistant. In two of his cases this adaptation of the convexity of the plate to the anterior wall of the esophagus is especially remarked upon, and it is in these cases that a negative finding by the sound most frequently results, especially with elastic sounds which tend to follow the posterior wall of the esophagus.—*Dental Brief*.

HINTS, QUERIES, AND COMMENTS.

HYPERTROPHY AND HYPERPLASIA OF THE GUM.

IN the treatment of ulitic hypertrophy and hyperplasia, as in all pathological manifestations, due account must be taken of the factors leading to the causation, in order to outline a course of treatment in harmony therewith.

Ulitic hypertrophy may be divided into local or general, according as only part or all of the gum region is affected. The local variety is frequently met with in dental practice in the shape of overhanging gum margins, and may be localized in the region of one tooth or of several teeth, but the general class of hypertrophy involving the entire gum region, which properly speaking should be designated as ulitic hyperplasia, is a rare affection, and only a limited number of cases are on record. Overhanging gum margins and ulitic puffiness, as observed in unhygienic mouths, are disturbances which strictly speaking belong to the hypertrophic variety of disorders, whereas abnormal growth of the gums *en masse* must be classified under the head of hyperplasia. In hypertrophy the growth is due to an increase in the size of the cells, while hyperplasia implies a division and proliferation of cellular elements.

Perhaps a slight reference to the pathology of hypertrophy and hyperplasia in general will not be considered amiss in this connection, as the treatment of this disturbance of nutrition, wherever found, must be based upon a clear understanding of its cause and pathological anatomy. In a general way it may be stated that hypertrophy and hyperplasia are the outcome of faulty metabolism. It stands to reason that if the degree of work normally performed by a given organ represents at a given period an amount of energy inferior to the kinetic units represented by the nutritional elements supplied to its parenchyma, the result will be manifested in an increase in the size and perhaps in the number of its cells. But, in considering the supply of nourishment as a probable cause of the disturbance

in question, we cannot lose sight of the fact that a certain degree of irritation is always necessary in order to stimulate the cell to assimilate the extra supply of food, as in the absence of proper stimulants the cell will only absorb the nourishment necessary for its subsistence. Increased nutrition is intimately associated with increased circulation, which in turn is consequent upon reflex nervous action. If a cell or set of cells becomes the seat of irritation, continuous but mild in character, a volume of blood above the normal will be carried to the part, as the result of vaso-motor stimulation. Hence it will be readily seen that if the energy there manifested as the result of excessive blood supply does not find a proper outlet as normal functional activity, it will bring about in time, and under favorable conditions, an increase in the size of the cells or in their number. On the other hand, hyperplasia may be consequent upon a decrease in the functional activity of an organ, the nutrition remaining the same, as witnessed in the hypercementosed roots of teeth that have lost their antagonists. Diminished functional activity, as the cause of hypertrophy, must be accepted as a fact in view of our present knowledge as to the factors concerned in the maintenance of body equilibrium.

Ziegler states that in tissues that are normally in constant use a lessening wear may lead to hypertrophy. For instance, a diminished desquamation of the epidermal layer of the skin leads to a pathological thickening of it. If the incisor teeth of the rodents are no longer normally worn down, by reason of the destruction of an opposing tooth or from the oblique position of the teeth, they may grow to be very long and curved. Ziegler, however, considers that the commonest cause of pathological new-growth is a frequently repeated or persistent irritation of the tissues, of mechanical or chemical nature, associated with disturbances of circulation. Hypertrophied gums are at times observed in syphilitics as the result of irritation of the oral mucous membrane produced by the elimination

of mercury, which, as is well known, takes place partly through the mucous membrane of the mouth.

Roe (*DENTAL COSMOS*, vol. xliii, No. 4) recognizes two forms of hypertrophied gums—true and localized. The cases he has described as belonging to the true variety of hypertrophy would perhaps have been better classified under the heading of hyperplasia, as the histological examination which revealed the presence of numerous small bloodvessels and lymphoid cells in the upper layer of the tunica propria and an abnormal number of connective tissue elements in the deeper layer, as well as the size of the growth, would imply a proliferation of cells indicative of hyperplasia. In the sections made from the growths removed by Roe, and stained by Weigert's method, many yeast fungi were found, leading that author to believe that the *saccharomyces*, or yeast fungus, is the cause of this condition.

From the foregoing survey of the pathology of hyperplasia and hypertrophy it must be concluded that the increase in the size (hypertrophy), or in the number of cells (hyperplasia), of an organ is the result of either mild and continuous irritation or of diminished functional activity, provided that the nutrition supplied to the organ remains normal. The purpose of referring to the pathology of this malady has been mainly to point out the necessity in treatment of eliminating the irritating factor, and of inducing in the hypertrophied organ a return to its normal amount of functional activity before a cure can be effected or even an improvement expected.

Local hypertrophy of the gum is, as a rule, caused by mechanical irritation, as a misfitting prosthetic appliance, a badly adjusted clasp, crown, regulating appliance, bridge, metal, or vulcanite plate; and to the injudicious use of rubber-dam clamps. Some cases are evidently caused by the rough cervical edge of a filling, while others can be traced to the ragged edge of an unfilled cavity, and perhaps to irritation both chemical and microbic.

General hypertrophy of the gums is a remote consequence of carelessness about the mouth and teeth, establishing centers of infection and irritation in the approximal spaces in and around the cervical margins.

The accumulations of salivary deposits must also be mentioned as a contributing factor in the causation of ulitic hyperplasia, but whatever may happen to be the cause in a given case—whether protracted unhygienic condition, the presence of salivary calculi, or any other source of irritation—the principles underlying the treatment remain the same, viz, the removal of the center or centers of irritation and of the hypertrophied tissue.

The first step in the treatment of both varieties—local and general—should consist in the removal of the apparent source of irritation. The tooth or teeth should be thoroughly scaled; not even the smallest particle of salivary calculus should be permitted to remain attached to the roots or crowns, in order to eliminate, so far as it may be possible, all apparent source of irritation. A suitable mouth-wash should then be prescribed, to be used as often as circumstances may require. An astringent and stimulating mouth-wash recommended for this purpose is as follows:

R—Alcoholis,	℥j;
Tinct. capsici comp.,	℥j;
Sodæ biborat.,	℥j;
Tinct. cinchonæ,	℥j;
Aquæ destillatæ,	℥vj. M.

Sig.—Use as mouth-wash, diluted or in full strength.

The next step in the course of treatment consists in the removal of the growths. This may be accomplished in several ways. Successful results have been accomplished by scarifying the affected parts and touching them lightly with zinc chlorid solution fifteen or twenty grains to the ounce. In very extensive cases involving practically all of the gum area, removal by surgical means is indicated, but in those in which the flap of tissue is apparently an outgrowth from the underlying normal gum structure, cauterizations with fifty per cent. trichloroacetic acid upon alternate days has given the writer most successful results in two cases in which the growths were of the hyperplastic variety.

The writer ventures to present these few notes in view of the fact that practically nothing on the subject appears in the works on dental pathology that have come under his observation.

JULIO ENDELMAN.

OBITUARY.

NOTE.—At the moment of going to press we learn of the death of Dr. J. FOSTER FLAGG. An obituary notice of Dr. Flagg will appear in our January issue.

MR. THOMAS FLETCHER, F.C.S.

DIED, at Kirkhams, near Manchester, Eng., September 20, 1903, at the age of sixty-four, Mr. THOMAS FLETCHER, F.C.S.

Mr. Fletcher first directed his attention to the study of medicine, but having become interested in dentistry took up this specialty, to which, through his conscientious work and natural ability, he made many and valuable contributions.

Mr. Fletcher did not limit his investigations to strictly dental matters, and his lecture before the Society of Arts of Manchester, in 1884, on "Gaseous Fuel," placed him among the highest authorities on this important branch of engineering.

Among his contributions to dentistry, his treatise on "Dental Metallurgy" deserves special mention. This work received the unqualified approval of dental teachers, and its usefulness may be seen by its having been translated into French, German, and Italian.

At the time of his death Mr. Fletcher was chairman and managing director of the firm of Fletcher, Russell & Co., of Warrington and Pendleton, which he organized. He was an honorary member of the North Midland Branch of the British Dental Association.

His untimely decease will be keenly felt not only by his friends and co-workers in the British Isles, but by the dental profession the world over, as he occupied a prominent place before the fraternity in recognition of his untiring efforts to advance the status of his chosen profession.

"IN MEMORIAM" RESOLUTIONS.

Dr. W. C. Barrett.

The following resolutions were passed at a meeting of the Chicago Odontological Society.

Whereas, In the fulness of time, having lived nearly the allotted threescore years and ten, our friend and associate William Carey Barrett departed this life on August 22, 1903:

Death is the anticipated end of man and we rejoice that our beloved brother sleeps the sleep that knows no waking, in the full consciousness that he had performed all the duties of life in a manner that we, his associates, may strive to emulate. May his spirit rest in peace! Be it therefore

RESOLVED, That the members of the Odontological Society of Chicago, in full meeting assembled, testify their belief in the upright character and devotion to principle of their brother, W. C. Barrett, and that they one and all mourn his sudden taking off. This society further tenders to his family and friends their sincere condolence, and it is ordered that a page be set apart in their record book to permanently preserve this note for all time.

RESOLVED, That a copy be sent to the leading dental journals for publication and one to the widow of our friend.

A. W. HARLAN,
TRUMAN W. BROPHY,
JOSEPH W. WASSALL,
Committee.

Dr. Jonathan Taft.

At a meeting of the Fraternal Dental Society of St. Louis held October 20, 1903, the following resolution was introduced by Dr. B. L. Morpe, and unanimously adopted:

Whereas, After a long and useful career of sixty years as practitioner, author, journalist, and teacher, death has ended the life's work of Professor Jonathan Taft, who was universally loved and respected by the dental profession for his scholarly attainments and high ethical standing; and

Whereas, In the death of Dr. Taft our profession has lost an advanced thinker and an able and enthusiastic exponent of the best in dental surgery; therefore be it

RESOLVED, That we the Fraternal Dental Society of St. Louis extend our sincere sympathy to Mrs. Taft in her bereavement, which is the bereavement of the whole profession, and express our high regard for the worth and character of this pioneer, who so ably exemplified the highest ideal of American dentistry.

W. L. WHIPPLE, *Pres. pro tem.*
E. E. HAVERSTICK, *Sec'y.*

SOCIETY NOTES AND ANNOUNCEMENTS.

UNIVERSAL EXPOSITION, ST. LOUIS, 1904.

FOURTH INTERNATIONAL DENTAL CONGRESS.

August 29 to Sept. 3, 1904.

Committee of Organization Dental Congress.

H. J. BURKHART, Chairman.

E. C. KIRK, Secretary.

R. H. HOFHEINZ,	J. W. DAVID,
WM. CARR,	WM. CRENSHAW,
W. E. BOARDMAN,	DON M. GALLIE,
V. E. TURNER,	G. V. I. BROWN,
J. Y. CRAWFORD,	A. H. PECK,
M. F. FINLEY,	J. D. PATTERSON,
	B. L. THORPE.

The Department of Congresses of the Universal Exposition, St. Louis, 1904, has nominated the Committee of Organization of the Fourth International Dental Congress which was appointed by the National Dental Association, and has instructed the committee thus appointed to proceed with the work of organization of said Congress.

Pursuant to the instructions of the Director of Congresses of the Universal Exposition, 1904, the Committee of Organization presents the subjoined outline of the plan of organization of the Dental Congress.

The Congress will be divided into two departments: Department A—SCIENCE (divided into four sections). Department B—APPLIED SCIENCE (divided into six sections).

DEPARTMENT A—SCIENCE.

- I. Anatomy, Physiology, Histology, and Microscopy. Chairman, M. H. Cryer.
- II. Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.
- III. Chemistry and Metallurgy. Chairman, J. D. Hodgen.
- IV. Hygiene, Prophylaxis, Therapeutics, Materia Medica, and Electro-therapeutics. Chairman, A. H. Peck.

DEPARTMENT B—APPLIED SCIENCE.

- V. Oral Surgery. Chairman, G. V. I. Brown.
- VI. Orthodontia. Chairman, E. H. Angle.

VII. Operative Dentistry. Chairman, C. N. Johnson.

VIII. Prosthesis. Chairman, C. R. Turner.

IX. Education, Nomenclature, Literature, and History. Chairman, Truman W. Brophy.

X. Legislation. Chairman, Wm. Carr.

COMMITTEES.

Following are the committees appointed:

- Finance. Chairman, C. S. Butler.
 Program. Chairman, A. H. Peck.
 Exhibits. Chairman, D. M. Gallie.
 Transportation. (To be appointed.)
 Reception. Chairman, B. Holly Smith.
 Registration. Chairman, B. L. Thorpe.
 Printing and Publication. Chairman, W. E. Boardman.
 Conference with State and Local Dental Societies. Chairman, J. A. Libbey.
 Dental Legislation. Chairman, Wm. Carr.
 Auditing. (Committee of Organization.)
 Invitation. Chairman, L. G. Noel.
 Membership. Chairman, J. D. Patterson.
 Educational Methods. Chairman, T. W. Brophy.
 Oral Surgery. Chairman, G. V. I. Brown.
 Prosthetic Dentistry. Chairman, C. R. Turner.
 Local Committee of Arrangements and Reception. Chairman, Wm. Conrad.
 Essays. Chairman, Wilbur F. Litch.
 History of Dentistry. Chairman, Wm. H. Trueman.
 Nomenclature. Chairman, A. H. Thompson.
 Promotion of Appointment of Dental Surgeons in the Armies and Navies of the World. Chairman, Wms. Donnally.
 Care of the Teeth of the Poor. Chairman, Thomas Fillebrown.
 Etiology, Pathology, and Bacteriology. Chairman, R. H. Hofheinz.
 Prize Essays. Chairman, James Truman.
 Oral Hygiene, Prophylaxis, Materia Medica, Therapeutics, and Electro-therapeutics. Chairman, A. H. Peck.

Operative Dentistry. Chairman, C. N. Johnson.

Resolutions. Chairman, J. Y. Crawford.

Clinics. Chairman, C. E. Bentley.

Nominations. (To be appointed.)

Ad interim. Chairman, G. V. I. Brown.

The officers of the Congress, president, vice-presidents, secretary, and treasurer, will be elected by the Congress at large at the time of the meeting, and will be nominated by the Nominating Committee.

The Fourth International Dental Congress, which will be held August 29 to September 3 inclusive, 1904, will be representative of the existing status of dentistry throughout the world. It is intended further that the Congress shall set forth the history and material progress of dentistry from its crude beginnings through its developmental stages, up to its present condition as a scientific profession.

The International Dental Congress is but one of the large number of congresses to be held during the period of the Louisiana Purchase Exposition, and these in their entirety are intended to exhibit the intellectual progress of the world, as the Exposition will set forth the material progress which has taken place since the Columbian Exposition in 1893.

It is important that each member of the dental profession in America regard this effort to hold an International Dental Congress as a matter in which he has an individual interest, and one which he is under obligation to personally help toward a successful issue. The dental profession of America has not only its own professional record to maintain with a just pride, but, as it is called upon to act the part of host in a gathering of our colleagues from all parts of the world, it has to sustain the reputation of American hospitality as well.

The Committee of Organization appeals earnestly to each member of the profession to do his part in making the Congress a success. Later bulletins will be issued setting forth the personnel of the organization and other particulars, when the details have been more fully arranged.

H. J. BURKHART, *Chairman*,
E. C. KIRK, *Secretary*.

Approved:

HOWARD J. ROGERS, *Director of Congresses*.

DAVID R. FRANCIS, *President of Exposition*.

“F. D. I.”

INTERNATIONAL DENTAL FEDERATION.

(*International Grouping of Dental Interests.*)

Circular to the Presidents of National Dental Societies.

OFFICE OF THE SECRETARY GENERAL,
45 RUE DE LA TOUR D'AUVERGNE,
PARIS, Sept. 18, 1903.

Dear Sir and Honored Confrère,—The International Dental Federation at its meeting held in Stockholm in August 1902, in accordance with the powers that had been conferred upon it, decided that the Fourth International Dental Congress be held at St. Louis, Missouri, in August 1904, at the time of the holding of the St. Louis Universal Exposition. The decision thus reached followed the receipt of invitations regularly addressed to the F. D. I. by the National Dental Association, the Odontological Society of St. Joseph, the National Association of Dental Examiners, The Odontographic Society of Missouri and Western Kansas, the Society of Dental Science of St. Louis, the Committee appointed by the Missouri State Dental Association, the Dental Society of St. Louis, the City of St. Louis, the Government of the State of Missouri, and the authorities of the Louisiana Purchase Exposition. This decision was confirmed at the session of the F. D. I. held in Madrid in April 1903.

The officers of the Executive Council of the F. D. I., in accord with the authorities of the Exposition and the Committee of Organization of the Congress, have determined the conditions under which the Federation will take part in the organization of said Congress, and we are now officially advised that the Fourth International Dental Congress will be held in the city of St. Louis in 1904, from August 29th to September 3d, inclusive.

The purpose of this circular is to inform you that the International Dental Federation has decided to lend its entire support to the organizers of the Fourth International Dental Congress, and, in view of assuring the perfect success of the Congress, we therefore request you to appeal to the several dental societies in your country to take part in the said Fourth International Dental Congress.

It seems unnecessary to call your attention

to the importance of all dental societies the world over being appropriately represented at this gathering, both scientifically and professionally. We think it, however, desirable to call attention to matters which the delegates of the different federations and national societies will be called upon to discuss with reference to the organization of the second term of the International Dental Federation—that which will be comprised, namely, in the period between the fourth and the fifth international dental congresses.

During the first working period of the F. D. I., comprised between the Third International Dental Congress held in Paris in 1900 and that of St. Louis to be held in 1904, the members of the Executive Council of the F. D. I. who were appointed in Paris by your representatives have fulfilled to the best of their abilities the mission with which they had been entrusted by the members of the Third International Dental Congress, of which you may have been able to judge from perusal of the printed transactions of its different meetings.

They have assured the holding of a Fourth International Dental Congress (resolution No. 13).

They have created an International Commission of Education, which presented a program of international dental education at the sessions held in London, Cambridge, Stockholm, and Madrid (resolution No. 16).

The International Commission of Dental Hygiene, organized at the Cambridge session, will at the St. Louis meeting complete the program of international dental hygiene to be recommended to the public authorities.

Other projects of interest to the evolution of dentistry—such, for instance, as the publication of an international dental review—are being carefully studied in view of future realization. Reports have been prepared and presented on the federation of schools; and other propositions are now under consideration, such as the creation of a universal nomenclature, and also of a code of ethics to be universally accepted. The execution of these projects will devolve upon our successors in the subsequent terms of the F. D. I.

It will be the duty of the delegates to the St. Louis Congress to ratify the constitution of the F. D. I., to introduce such amendments as may be necessary, to appoint the members that will represent the different countries in

the Executive Council, and to decide on the program of the second period of the F. D. I.

Appreciating the importance of the great international gathering to be held in St. Louis in August 1904, we are convinced that you will be able to induce the national dental association and the other dental societies of your country to take part in the Congress by sending delegates and by contributing scientific papers.

We request that this circular be published in all the dental journals of your country.

Please accept, dear sir and *confrère*, the assurances of our fraternal sentiments.

DR. CH. GODON, *President*,

DR. E. SAUVEZ, *Secretary General*.

Fourth International Dental Congress.

COMMITTEE ON STATE AND LOCAL ORGANIZATIONS.

J. A. LIBBEY, *Chairman*,
524 Penn Avenue, Pittsburgh, Pa.

THE Committee on State and Local Organizations is a committee appointed by the Committee of Organization of the Fourth International Congress with the object of promoting the interests of the Congress in the several states of the Union. Each member of the committee is charged with the duty of receiving applications for membership in the Congress under the rules governing membership as prescribed by the Committee on Membership and approved by the Committee of Organization. These rules provide that *membership in the Congress shall be open to all reputable legally qualified practitioners of dentistry*. Membership in a state or local society is not a necessary qualification for membership in the Congress.

Each state chairman, as named below, is furnished with official application blanks and is authorized to accept the membership fee of ten dollars from all eligible applicants within his state. The state chairman will at once forward the fee and official application with his indorsement to the chairman of the Finance Committee, who will issue the official certificate conferring membership in the Congress. No application from any of the states will be accepted by the chairman of the Finance Committee unless approved by the state

chairman, whose indorsement is a certification of eligibility under the membership rules.

A certificate of membership in the Congress will entitle the holder thereof to all the rights and privileges of the Congress, the right of debate, and of voting on all questions which the Congress will be called upon to decide. It will also entitle the member to one copy of the official transactions when published and to participation in all the events for social entertainment which will be officially provided at the time of the Congress.

The attention of all reputable legally qualified practitioners of dentistry is called to the foregoing plan authorized by the Committee of Organization for securing membership in the Congress, and the Committee earnestly appeals to each eligible practitioner in the United States who is interested in the success of this great international meeting to make application at once through his state chairman for a membership certificate. By acting promptly in this matter the purpose of the committee to make the Fourth International Dental Congress the largest and most successful meeting of dentists ever held will be realized, and the Congress will thus be placed upon a sound financial basis.

Let everyone make it his individual business to help at least to the extent of enrolling himself as a member and the success of the undertaking will be quickly assured. Apply at once to your state chairman. The state chairmen already appointed are as follows:

General Chairman—J. A. LIBBEY, 524 Penn Ave., Pittsburg, Pa.

States.

Alabama. H. CLAY HASSELL, Tuscaloosa.
Arkansas. W. H. BUCKLEY, 510½ Main St., Little Rock.

California. H. P. CARLTON, Crocker Bldg., San Francisco.

Colorado. H. A. FYNN, 500 California Bldg., Denver.

Connecticut. HENRY McMANUS, 92 Pratt St., Hartford.

Delaware. C. R. JEFFRIES, New Century Bldg., Wilmington.

District of Columbia. W. N. COGAN, The Sherman, Washington.

Florida. W. G. MASON, Tampa.

Georgia. H. H. JOHNSON, Macon.

Idaho. J. B. BURNS, Payette.

Illinois. F. H. ZINN, 100 State St., Chicago.
Indiana. H. C. KAHLO, 115 E. New York St., Indianapolis.

Iowa. W. R. CLACK, Clear Lake.

Kansas. G. A. ESTERLY, Lawrence.

Kentucky. H. B. TILESTON, 314 Equitable Bldg., Louisville.

Louisiana. JULES J. SARRAZIN, 108 Bourbon St., New Orleans.

Maryland. W. G. FOSTER, 813 Eutaw St., Baltimore.

Massachusetts. M. C. SMITH, 3 Lee Hall, Lynn.

Michigan. G. S. SHATTUCK, 539 Fourth Ave., Detroit.

Minnesota. C. A. VAN DUZEE, 51 Germania Bank Bldg., St. Paul.

Missouri. J. W. HULL, Altman Bldg., Kansas City.

Nebraska. H. A. SHANNON, 1136 "O" St., Lincoln.

New Jersey. ALPHONSO IRWIN, 425 Cooper St., Camden.

New York. B. C. NASH, 142 W. 78th St., New York City.

North Carolina. C. L. ALEXANDER, Charlotte.

Ohio. HENRY BARNES, 1415 New England Bldg., Cleveland.

Oklahoma. T. P. BRINGHURST, Shawnee.

Pennsylvania. H. E. ROBERTS, 1516 Locust St., Philadelphia.

Rhode Island. D. F. KEEFE, 315 Butler Exchange, Providence.

South Carolina. J. T. CALVERT, Spartanburg.

Tennessee. J. P. GRAY, Berry Block, Nashville.

Texas. J. G. FIFE, Dallas.

Utah. W. L. ELLERBECK, 21 Hooper Bldg., Salt Lake City.

Virginia. F. W. STIFF, 2101 Churchill Ave., Richmond.

West Virginia. H. H. HARRISON, 1141 Main St., Wheeling.

Wisconsin. A. D. GROPPER, 401 E. Water St., Milwaukee.

For the Committee of Organization,

EDWARD C. KIRK, *Secretary*.

OHIO STATE DENTAL SOCIETY.

THE thirty-eighth annual meeting of the Ohio State Dental Society will be held at the Great Southern Hotel, Columbus, Ohio, December 1, 2, and 3, 1903.

Visitors are always welcome.

S. D. RUGGLES, *Sec'y*, Portsmouth, Ohio.

A GOLDEN ANNIVERSARY CELEBRATION.

CLASS OF 1854, PHILADELPHIA COLLEGE OF DENTAL SURGERY.

THE dental profession of Philadelphia, represented by all of its organizations, will celebrate on February 27, 1904, the fiftieth anniversary of the graduation of the Class of 1854 of the Philadelphia College of Dental Surgery by a complimentary banquet to the surviving members of the class, consisting of Drs. LOUIS JACK, JAMES TRUMAN, C. NEWLIN PEIRCE, W. STORER HOW, and ERI W. HAINES.

All dentists in good standing are invited to participate. The subscription price, including a banquet ticket and one copy of the souvenir historical volume to be published in commemoration of the event, has been fixed at ten dollars. The subscription list will be open until February 10, 1904.

The committee in charge of the celebration consists of the following members:

EDWIN T. DARBY,	G. L. S. JAMESON,
EDWARD C. KIRK,	J. D. THOMAS,
R. H. D. SWING,	WILBUR F. LITCH,
ALBERT N. GAYLORD,	H. C. REGISTER,
EARL C. RICE,	WM. H. TRUEMAN,
I. N. BROOMELL,	ROBERT HUEY,
J. T. LIPPINCOTT,	WM. L. J. GRIFFIN,
L. FOSTER JACK,	J. CLARENCE SALVAS,
D. N. MCQUILLEN.	

Applications together with the subscription may be forwarded to the chairman of the Invitation Committee,

ROBERT HUEY, D.D.S.,
330 So. Fifteenth st., Philadelphia.

ARMY DENTAL CORPS ITEMS.

AMONG the bills presented at first session of the Fifty-eighth Congress is the following by Mr. Brownlow, which in justice to the dental corps of the army should become a law—ED. COSMOS:

"H. R. 79—Mr. Brownlow: Provides for a corps of dental surgeons for the Army not to exceed in number the actual requirements nor the proportion of one to one thousand. The corps to consist of three grades designated assistant dental surgeon, passed assistant dental surgeon, and dental surgeon, grades to correspond to medical corps grades of assistant surgeon, passed assistant surgeon, and surgeon respectively. Appointees to the corps to be citizens, between twenty-two and twenty-

nine years of age, graduates of standard dental colleges, of good moral character, of unquestionable professional repute, and shall be required to pass the usual physical examination and a professional examination. Contract dental surgeons attached to the army at the time of the passage of this act may be appointed, three of them to the grade of passed assistant dental surgeon and the others to the grade of assistant dental surgeon. Other appointments to be original.

"H. R. 81—Mr. Brownlow: To add a corps of dental surgeons to the Bureau of Medicine and Surgery of the Navy."

ORDERS.

Contract Dental Surgeon J. R. Bernheim will report at Camp Downes, Ormoc, Leyte, for duty. (September 14, D. V.)

Contract Dental Surgeon John A. McAllister, now at Camp Wallace, Union, will proceed to Camp Morrison, South Ilocos, for duty. (September 15, D. Luzon.)

Contract Dental Surgeon William C. Fisher, from duty at Fort Sheridan to Columbus Barracks, Ohio, for duty. (September 15, D. L.)

Contract Dental Surgeon Rex H. Rhoades, from duty at Fort Leavenworth, Kans., to San Francisco, for transportation to the Philippine Islands, for duty. (November 7, W. D.)

Contract Dental Surgeon Douglas E. Foster, now at Fort Hancock, N. J., will proceed to Fort Myer, Va., for temporary duty. (November 10, W. D.)—*Army and Navy Journal*.

UTAH STATE DENTAL ASSOCIATION.

At a meeting held in Salt Lake City on October 8, 1903, the Utah State Dental Association, which has been slumbering for some time, was revived. The day was given over to papers and clinics, which were very profitable.

In the evening the dentists of Salt Lake City banqueted their visiting brethren, at which time fifteen new members were enrolled.

The following officers were elected: W. G. Dalrymple, Ogden, president; G. F. Steihl, Salt Lake City, vice-president; J. W. Baisal, Salt Lake City, second vice-president; S. W. Wherry, Ogden, secretary and treasurer.

S. W. WHERRY, Sec'y, Ogden, Utah.

NATIONAL DENTAL ASSOCIATION—SOUTHERN BRANCH.

THE next regular meeting of the Southern Branch of the National Dental Association will be held in Washington, D. C., February 23, 24, and 25, 1904.

This meeting will be of unusual interest and one which you cannot afford to miss. Washington is a most interesting city and an ideal place of meeting.

CARROLL H. FRINK, *Cor. Sec'y N. D. A. So. Br.*
Fernandina, Fla.

AMERICAN SOCIETY OF ORTHODONTISTS.

THE third annual meeting of the American Society of Orthodontists will be held December 31, 1903, and January 1 and 2, 1904, at the Hotel Iroquois, Buffalo, N. Y.

The following program has been arranged:

THURSDAY, DECEMBER 31, 1903.

Morning Session.—(1) Dr. Milton T. Watson, Detroit, Mich.: President's Address. (2) Dr. I. N. Broomell, Philadelphia, Pa.: "Microscopic Tooth-Development."

Afternoon Session.—(1) Dr. R. Ottolengui, New York, N. Y.: "A Study of Occlusal Relations of the Jaws of Cleft Palate Cases." (2) Anna Hopkins, D.D.S., St. Louis, Mo.: "Some Examples of the Orthodontia of the Old School." (3) Robert Dunn, D.D.S., San Francisco, Cal.: Subject to be announced.

Evening Session.—(1) Mr. Elbert Hubbard, East Aurora, N. Y.: "The Importance of Specialization."

JANUARY 1, 1904.

Morning Session.—(1) Dr. N. S. Hoff, Ann Arbor, Mich.: "How Much Orthodontia Should We Attempt to Teach Students in Dental Colleges?" (2) Herbert A. Pullen, D.D.S., Buffalo, N. Y.: "The Great First Class of Malocclusion." (3) Edward H. Angle, M.D., D.D.S., St. Louis, Mo.: "Orthodontia in the Universal Exposition Dental Congress."

Afternoon Session.—(1) Reports of Cases in Orthodontia—Illustrated by the Stereopticon: Dr. M. T. Watson, Detroit, Mich.; Dr. Lloyd S. Lourie, Chicago, Ill.; Dr. G. P. Mendell, Minneapolis, Minn.; Dr. F. M. Casto, Columbus, Ohio; Dr. A. H. Ketcham, Denver,

Colo.; Dr. F. C. Kemple, Erie, Pa.; Dr. Norman G. Reoch, Boston, Mass.; Dr. D. Willard Flint, Pittsburg, Pa.; Dr. S. Merrill Weeks, Philadelphia, Pa.; Dr. Robert Dunn, San Francisco, Cal.; Dr. Rolof B. Stanley, New York, N. Y. (2) Exhibition and informal discussion of Anatomical Specimens, Illustrations, Models, and Appliances pertaining to Orthodontia. (3) Report of Committee on History and Invention.

Evening Session.—(1) Mr. Lucius W. Hitchcock, Director of Art Institute, Buffalo, N. Y.: "Art." (Illustrated lecture.)

JANUARY 2.

Morning Session.—(1) Artificial Substitutes for Missing Teeth in Orthodontia: Dr. Hart J. Goslee, Chicago, Ill.; Dr. Joseph Head, Philadelphia, Pa.; Dr. Frederick A. Peeso, Philadelphia, Pa. (2) Dr. José J. Rojo, City of Mexico, Mex.: Subject to be announced.

Afternoon Session.—(1) Dr. Park F. Lewis, Buffalo, N. Y.: "The Conformation of the Face in Relation to the Development of the Eye." (2) Dr. Frederick Bogue Noyes, Chicago, Ill.: "A Study of the Peridental Membrane from the Orthodontist's Standpoint." (3) Dr. Martin Dewey, Keokuk, Iowa.: "A Classification of the Principles and Forces of Retention."

RICHARD SUMMA,

HENRY E. LINDAS,

FRANK M. CASTO,

Board of Censors.

INSTITUTE OF DENTAL PEDAGOGICS.

THE eleventh annual meeting of the Institute of Dental Pedagogics will be held in Buffalo, December 28, 29, and 30, 1903, at the Iroquois Hotel. All interested in education and the elevation of the standards of the dental colleges and students are very earnestly requested to be present at this meeting. The following program has been arranged:

1. President's address, "Some Faults of the Prevailing Dental Training." J. D. Patterson, Kansas City. Discussion by John I. Hart, New York, B. Holly Smith, Baltimore, H. P. Carlton, San Francisco, Geo. E. Hunt, Indianapolis, R. H. Hofheinz, Rochester.

2. "Prosthesis." (a) "Methods of Teaching the Artistic Elements of Prosthetic Dentistry." A. O. Hunt, Omaha, Neb. (b) "Methods of Teaching the Anatomical Ar-

rangement of Teeth." B. J. Cigrand, Chicago. Discussion by N. S. Hoff, Ann Arbor, G. H. Wilson, Cleveland, R. R. Freeman, Nashville, F. H. Berry, Milwaukee.

3. "An Ideal in Pathology." D. R. Stubblefield, Nashville. Discussion by H. A. Smith, Cincinnati, T. B. Hartzell, Minneapolis, A. H. Peck, Chicago, O. L. Hertig, Pittsburg.

4. "Orthodontia Technology." S. H. Guilford, Philadelphia; C. S. Case, Chicago. Discussion by W. E. Grant, Louisville, A. E. Webster, Toronto, H. B. Pullen, Buffalo, H. T. Smith, Cincinnati.

5. "The Value of Instruction in Dental History and Literature." H. L. Ambler, Cleveland. Discussion by Chas. McManus, Hartford, J. H. Kennerly, St. Louis, B. J. Cigrand, Chicago.

6. "Porcelain Technology." H. J. Goslee, Chicago. Discussion by J. Q. Byram, Indianapolis, Ambler Tees, Philadelphia, L. E. Custer, Dayton, H. L. Banzhaf, Milwaukee, J. F. Ross, Toronto.

7. "The Dental Curriculum." Geo. E. Hunt, Indianapolis. Discussion by G. V. Black, Chicago, J. B. Willmott, Toronto.

8. "How Shall Quizzes be Conducted?" Symposium: F. D. Weisse, New York, R. H. Nones, Philadelphia, L. P. Bethel, Kent, Ohio.

9. "Exhibition of Recent Teaching Appliances." W. G. Foster, Baltimore; L. S. Tenney, Chicago.

10. Report of Master of Exhibits. Dr. Ellison Hillyer, Brooklyn.

11. *Banquet.* Wednesday evening.

W. H. WHITSLAR, *Ch'man Ex. Com.*

FIRST DISTRICT (N. Y.) DENTAL SOCIETY.

THE First District Dental Society of the State of New York will hold a clinic and exhibit at the Grand Central Palace, Forty-third st. and Lexington avenue, New York city, on Tuesday, December 8, 1903, at 1.30 P.M.

The dental profession is cordially invited. There will be a large and interesting program, to which the committee would like to add the names of every ethical member of the profession who can participate.

Exhibitors desiring space kindly communicate.

The regular meeting of the society, to which have been invited the Second District

Dental Society of New York and the Central Dental Association of Northern New Jersey, will be held at 8 P.M. at the Academy of Medicine.

W. D. TRACY,

RALPH B. REITZ,

S. L. GOLDSMITH,

Ch'man Clin. Com.,

129 East 60th st., New York city.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

EXAMINATIONS will be conducted by the Board of Dental Examiners of Pennsylvania simultaneously in Philadelphia and Pittsburg, December 15 to 18, 1903.

For application papers or any information, address

ISAAC B. BROWN, *Sec'y Dental Council,*
Harrisburg, Pa.

WISCONSIN BOARD OF DENTAL EXAMINERS.

THE next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates desiring license to practice dentistry in Wisconsin will be held in Milwaukee, at Hotel Pfister, January 25, 1904.

Application must be made to the secretary fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry consecutively for four years, or have been an apprentice to a dentist engaged in the reputable practice of dentistry for five years.

J. J. WRIGHT, *Sec'y,*
1218 Wells Bldg., Milwaukee, Wis.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS.

THE next regular semi-annual meeting of the South Dakota State Board of Dental Examiners to examine applicants for license to practice in the state will be held in Vermillion, December 8, 9, 10, and 11, 1903, beginning at 8 o'clock P.M. Positively no candidates will be received for examination after the 8th. Only those who hold diplomas from reputable dental colleges, and those having had three years of actual practice in dentistry immediately preceding the examination are eligible to take the same.

Candidates must come prepared to do all kinds of fillings. They must also bring with

them teeth and the necessary utensils for doing both bridge and vulcanite work.

The examination fee is ten dollars, and subsequently five dollars will be required if applicant is successful in passing the examination.

G. W. COLLINS, Vermillion, S. D.

NEW JERSEY BOARD OF REGISTRATION.

INTERCHANGE OF LICENSE.

THE National Board of Examiners, at its meeting at Asheville, N. C., last August, passed the following resolution:

"RESOLVED, That an interchange of license to practice dentistry be, and is hereby recommended to be, granted by the various state boards, on the following specific conditions:

"Any dentist who has been in legal practice for five years or more, and is a reputable dentist of good moral character, and who is desirous of making a change of residence into another state, may apply to the examining board of the state in which he resides, for a new certificate which shall attest to his moral character and professional attainments, and said certificate, if granted, shall be deposited with the examining board of the state in which he proposes to reside, and the said board, in exchange therefor, may grant him a license to practice dentistry."

It is important that every state board take

up the matter at once, and if possible place it by adoption upon their minute book, and be then prepared to act in this important matter of interchange of license should application be made.

The State Board of New Jersey has adopted the plan, and it is understood that Indiana and Ohio also have acted favorably upon it.

The New Jersey Board will be pleased to take this up with you and enter into a mutual understanding and reciprocity in this matter.

CHARLES A. MEEKER, *Sec'y*,
29 Fulton st., Newark, N. J.

ARKANSAS BOARD OF DENTAL EXAMINERS.

THE next regular meeting of the Arkansas State Board of Dental Examiners will be held December 4 and 5, 1903, in Little Rock, Ark., for the examination of all applicants. Those having applied for examination will report to the secretary, Friday, December 4, at 9 A.M., with rubber dam, gold, plastic filling material and instruments, to demonstrate their skill in operative dentistry. Any who wish may bring their patients; so far as possible, patients will be furnished. The board will select the cavities to be filled. The examination will cover all branches of the dental profession. For further information write the secretary.

A. T. McMILLIN, *Sec'y*,
Fifth and Main sts., Little Rock, Ark.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING OCTOBER 1903.

October 6.

- No. 740,538, to MARCUS A. COYKENDALL. Flushing splittoon.
- No. 740,549, to V. WALTER GILBERT. Dental pliers.
- No. 740,551, to WILLIAM C. GILLESPIE. Dental cutting-tool.

October 13.

- No. 741,071, to LEOPOLD A. DE ROSA. Dental appliance.

October 20.

- No. 741,687, to JAMES N. MACDOWELL. Tooth-regulating apparatus.
- No. 741,722, to WM. B. RYDER and CHAS. L. REYNOLDS. Tooth-brush.

- No. 741,890, to HENRY CRAIGIE. Dental dam.
- No. 742,011, to GEORGE J. DAVISON. Artificial denture.

October 27.

- No. 742,305, to NATHAN K. GARHART. Blast-controlling device for dental or other uses.
- No. 742,374, to WM. W. ALEXANDER. Circuit-controller for surgico-dental engines.
- No. 742,446, to HARRY P. KELLY. Dental filling-tool.
- No. 742,572, to DAVID N. BOOTH. Artificial tooth.
- No. 742,698, to EDGAR L. MASON. Dental jaw-prop.

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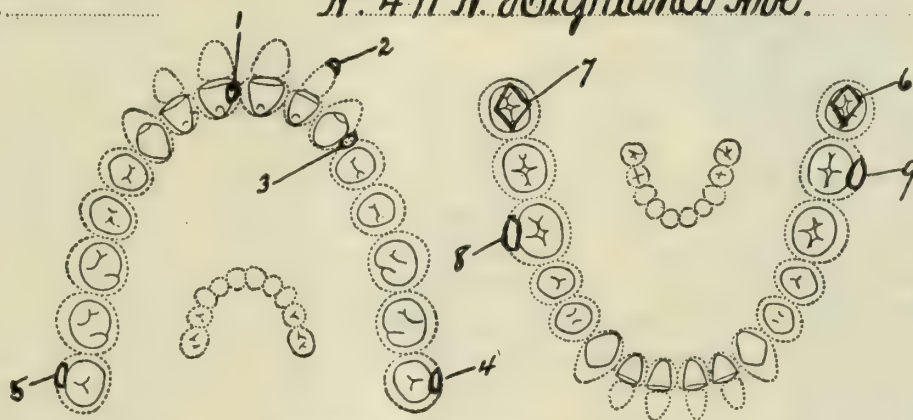
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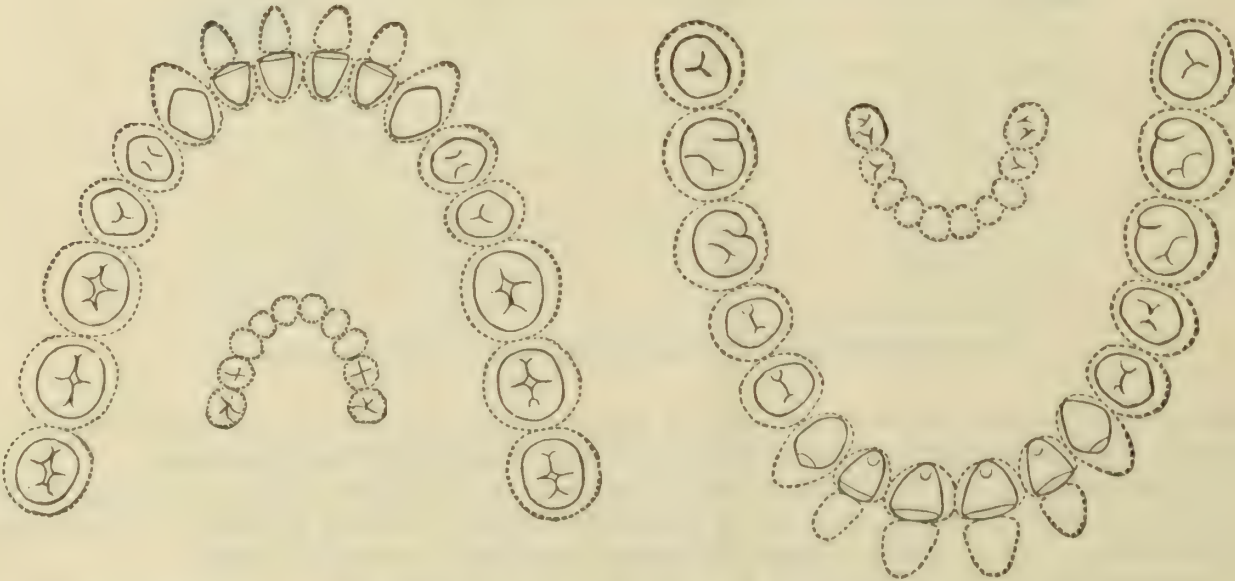
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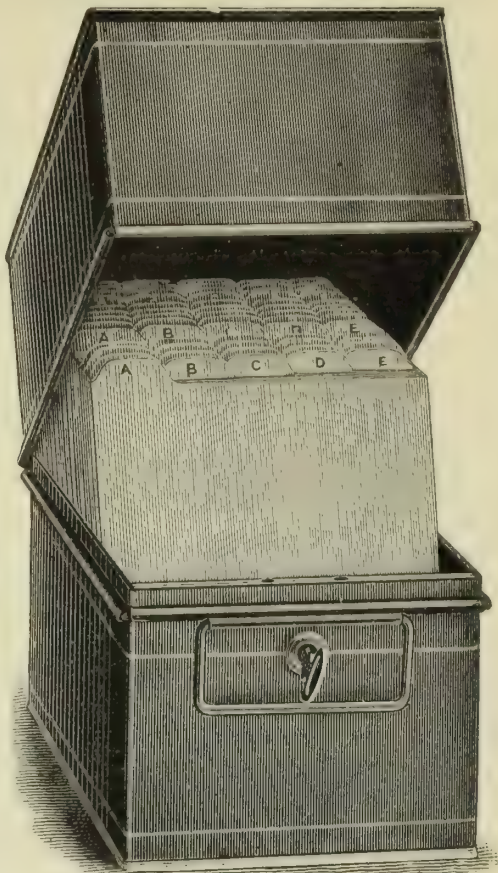
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1769 Easy St.
Recommended by Mr. Richard Roe.

	No.	Diagram about two-thirds actual size										Dr.	Cr.	MEMORANDA
		Gold Filling	Amalgam Filling	Phos. Zinc Filling	Gutta Percha Filling	Tin Filling	Artificial Crown	Bridge	Treatment	Cleaning Teeth	Extraction	Artificial Denture	Time Reserved	
1895	1	✓											7 50	
Feb. 20	2	✓											5 00	
"	3			✓									2 50	Pulp capped with Asbestos
"	4		✓										2 50	
"	5				✓								2 50	
"	6						✓						20 00	Richmond Crown - two pins.
March 3													40 00	
													340 00	

Diagram about two-thirds actual size

This is an extremely attractive book so far as external appearance goes, an impression which is strengthened by an examination of the plan on which it is laid out, and confirmed positively and finally by actual use.

It is nearly square, $11\frac{1}{2} \times 10\frac{1}{2}$ inches, opens flat, and contains two sizes of accounts, one size occupying an entire page, the other a half page.

A glance at the reduced reproduction of one of the small accounts will give an idea of how simple is the method of keeping accounts in this form. You simply fill in the date, put a check in the appropriate column, and enter the amount in the debit column. Each operation is of course numbered upon the diagram, the entries being correspondingly numbered for identification. The diagrams are printed in red, so that the numbers made in black ink are readily seen.

The method is quick, complete, and convenient, as well as simple.

The No. 2 Warren Ledger, 312 pages,—152 with a single account to the page, 160 with two to the page.

Half bound, American Russia, wine-colored cloth sides, red edges, ample index.

Price..... \$2.50

NERVE PASTE

A proper combination of arsenous acid and creasote that has proved to be a standard application to pulps when they are condemned to devitalization. Does its work promptly and with the least pain.

Price per bottle \$0.50

ALLPORT'S

Improved

Registering Dental Ledger

That the Allport Ledger, after forty odd years, is 'still probably more extensively used than any other dentists' account book is very good evidence of the vitality of the idea underlying it,—a diagram to indicate the location of the operation, a symbol to describe its character. The diagram and symbols cover the needs of any form of practice, and afford a simple, easily kept, accurate record.

Two accounts to the page, each with diagram as shown, with place for name, reference, date of operation, charges, and credit for amounts paid.

Good paper, substantially bound, with ample index. In stock regularly as priced below.

PRICES

340 Pages, Half Turkey, Cloth Sides	\$3.50
340 " " Roan, Paper	3.00
172 " " " "	2.00

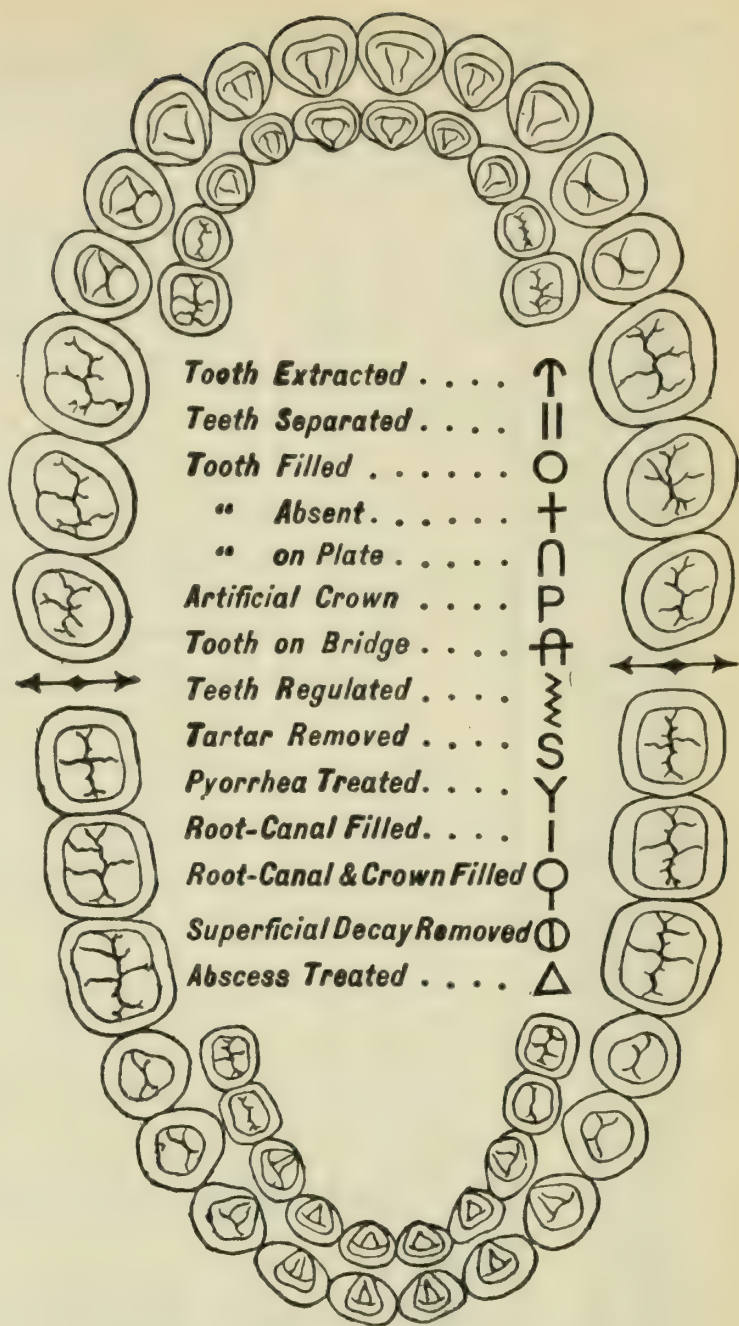


Diagram and Symbols

SPECIAL BILL-HEADS

All our stock Bill-Heads for dentists are printed all over,—that is, the lines are printed in black, the same as the typography. Of course, in using these the dentist has to write or stamp in his own name and address, as well as that of the patient. Those who prefer to have special Bill-Heads, with their own name and address printed on them, can have them made to order, at the following prices:

Nos. 1, 3, 5, one hundred.....	\$2.00
" 1, 3, 5, two "	2.75
" 1, 3, 5, three "	3.25
" 1, 3, 5, five "	3.75
" 1, 3, 5, one thousand.....	6.00
No. 2, one hundred.....	1.90
" 2, two "	2.40
" 2, three "	2.90
" 2, five "	3.40
" 2, one thousand.....	3.90

Larger numbers at the thousand rates. The prices for small lots look large; but all the special work has to be done for one the same as for a large quantity.

The S. S. White Dental Appointment Book No. 3



SATURDAY

APPOINTMENTS.

NAME	Hour.	No.	Gold Filling.	Amalgam Filling.	Phos. Zinc Filling.	Gutta Percha Filling.	Tin Filling.	Artificial Crown.	Bridge.	Treatment.	Oleating Teeth.	Extraction.	Artificial Denture.	Time Reserved.	Dr.	Cr.	MEMORANDA.
	8																
	9																
	10																
	11																
	12																
	1																
	2																
	3																
	4																
	5																

An Appointment Book with the unequalled Allan diagram, more especially for those who use the Warren Dental Ledger.

The book is oblong; the pages, of which there are 312, are 5½ x 9 inches. The diagram is printed in red (natural size), so that marks upon it will be more readily seen. Below the diagram are the spaces for appointments from 8 A.M. to 5 P.M., with headings for all the usual operations, and memorandum space for any special notes. The reduced reproduction of a page herewith gives a clear idea of the advantages of this book.

Printed on good paper, paged and indexed, bound in cloth, with leather back; red edges.

Price..... \$1.25

COTTONOID

Cottonoid is a preparation of the most perfect absorbent cotton, much resembling the well-known Fibre Lint in appearance. It is very useful in any way desired as a dental absorbent, as it can be cut to any size. Sold in sheets 12 inches long by 3½ inches wide, and put in ¼-lb. boxes. This quantity will make 200 napkins of the size used in the Duddy Holder.

Price ¼-lb. package \$0.25

The Diagram Appointment Book

The feature of this Appointment Book is the facility which it affords for making a brief but clear memorandum of the work to be done for each patient at the time the appointment is made.

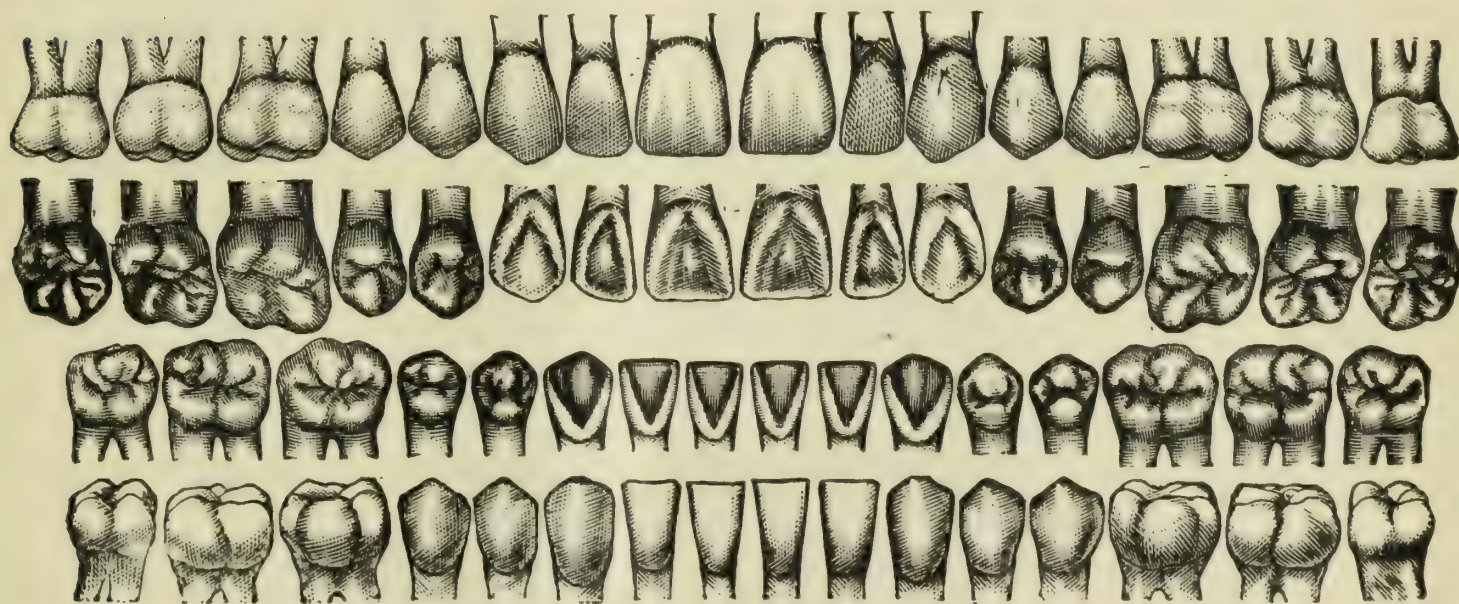
For each day there is a diagram of the teeth. As appointments are made, the hour set apart is noted upon the diagram, opposite the tooth or teeth to be treated. When the patient takes his place in the chair, a glance at the diagram shows the operator at once where the work is to begin.

The illustration shows a typical day's markings.

The book is $6\frac{1}{4} \times 4\frac{1}{4}$ inches. In the front are calendars for three years, and a table showing the number of days from any day in one month to the same day in any other month; following this are the appointment pages, a full week's appointments being shown when the book is opened. Back of this are pages for memoranda and blanks for monthly cash account and yearly summary. Supplied in cloth or leather.

Price, Cloth	\$0.30
“ Leather	.50

Allan's Examination Record



If you want to keep the Record of your Examination where you can refer to it in a moment, you will use the Examination Record as devised by Dr. Chas. F. Allan. In this Record the diagram shown above is printed on leaves (one side only). At the bottom of each leaf are blanks for the name of patient and date of examination, the space intervening being used for such memoranda as may be required. The leaves are bound in oblong books containing 100 each, on the front cover of which is the imprint "Examinations. From.....to....."

Keeping these accessible, the dentist has only to refer to his ledger to get the date of any examination made; then turn to the "Examinations," and it is but a moment's search to find the one wanted.

The diagram is the most complete in its exposition of the various surfaces of the teeth that has yet been brought forward.

We have also the books with the leaves numbered, and four ruled pages for indexing.

The book contains 100 leaves $5\frac{3}{4} \times 7\frac{1}{2}$ inches, with the diagram on each leaf.

Price, per book of 100 Diagrams, 5½ x 7½ inches	\$0.30
“ “ “ “ “ “ “ Indexed and Paged.....	.40

Dentists' Pocket Diary and Appointment Book

FOR

REGISTERING APPOINTMENTS FOR DENTAL OPERATIONS

MONDAY				19
8		1		
9		2		
10		3		
11		4		
12		5		
TUESDAY				19
8		1		
9		2		
10		3		
11		4		
12		5		
WEDNESDAY				19
8		1		
9		2		
10		3		
11		4		
12		5		

The Diagram shows the exact size and style of a page of the Pocket Diary and Appointment Book, presenting, when open, engagements for one week. The figures denote the hour of the engagement. It contains blanks for 54 weeks, and, being without date, is good for any time. It has also a neat Memorandum attached. One of the oldest and most popular forms.

Price, Flexible
Cover, Gilt
Edge\$0.55
Price, Flexible
Cover, Gilt
Edge, with
Pocket and
Tuck 80

The S. S. White Dental Mfg. Co.'s Absorbent Cotton

This Absorbent Cotton is clean, pure, long-fiber cotton, made hygroscopic by the extraction of the natural oils. An excellent absorbent,—acts quickly. Put up in the form of a roll, easily torn apart, yet retaining its form nicely.
Sold in 1-oz. and 2-oz. cartons and 1-lb. rolls.

Price per 1-oz. carton \$0.06
" " 2 " " .10
" 1-lb. roll .40

BILL-HEADS

The Bill-Heads comprised in our line of stationery for dentists' use can be used with any ledger, though most of them were devised to accompany special books. All are made of good paper.

The **half-size** illustrations show the forms of Bill-Heads and the character of diagrams on each.

BILL-HEAD No. 1

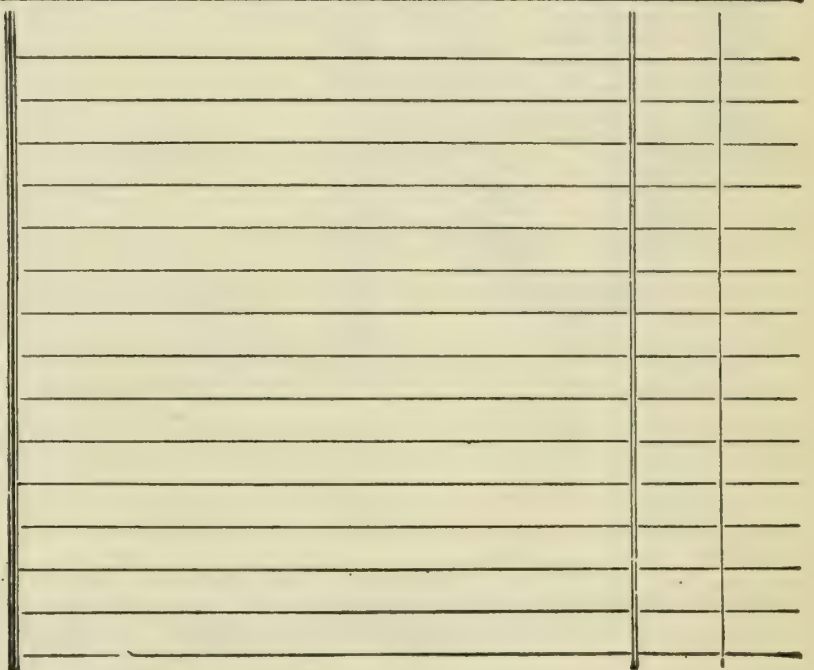
No. 1

19

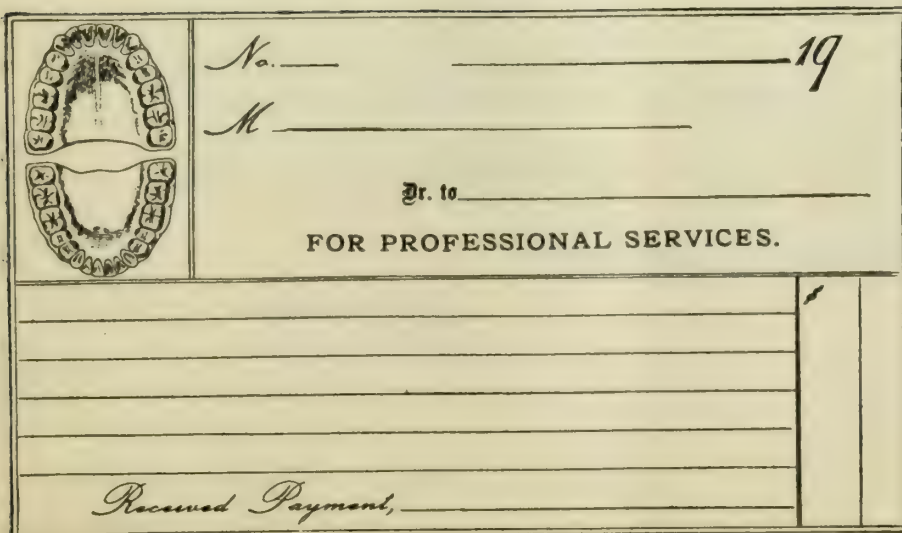
One of the oldest forms, but still in good demand. Diagram like that of the Allport Ledger, reduced, and without the symbols.

Size, $8\frac{1}{2}$ inches
wide by 7 inches
long. Put up in
tablets of 100.

Price, per	
tablet	\$0.60



BILL-HEAD No. 2



No. 2

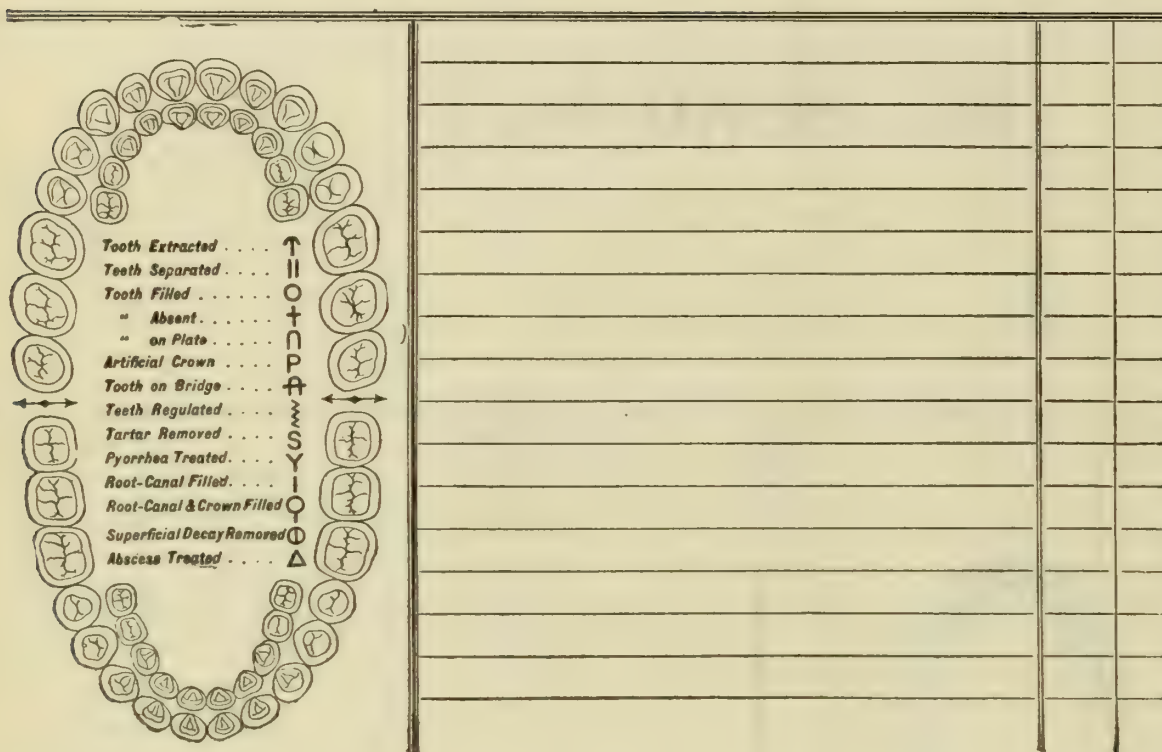
The diagram of the teeth used is that shown in Dental Cut No. 8. A neat, small form.

Size, $7\frac{1}{4}$ inches wide by $4\frac{1}{4}$ inches long. Put up in tablets of 100.

Price.....per tablet \$0.30

BILL-HEAD No. 3

Price, per tablet \$0.60



Price	per box	\$0.30
"	" doz.	3.00

BILL-HEAD No. 5

This **half-size** illustration shows the form.

Feb. _____

190



FOR
PROFESSIONAL SERVICES.

М.

Pa

Dr.

Designed for use with the Improved Warren Dental Ledger. Diagram a reduced facsimile, same as that shown in Examination Blank No. 3.

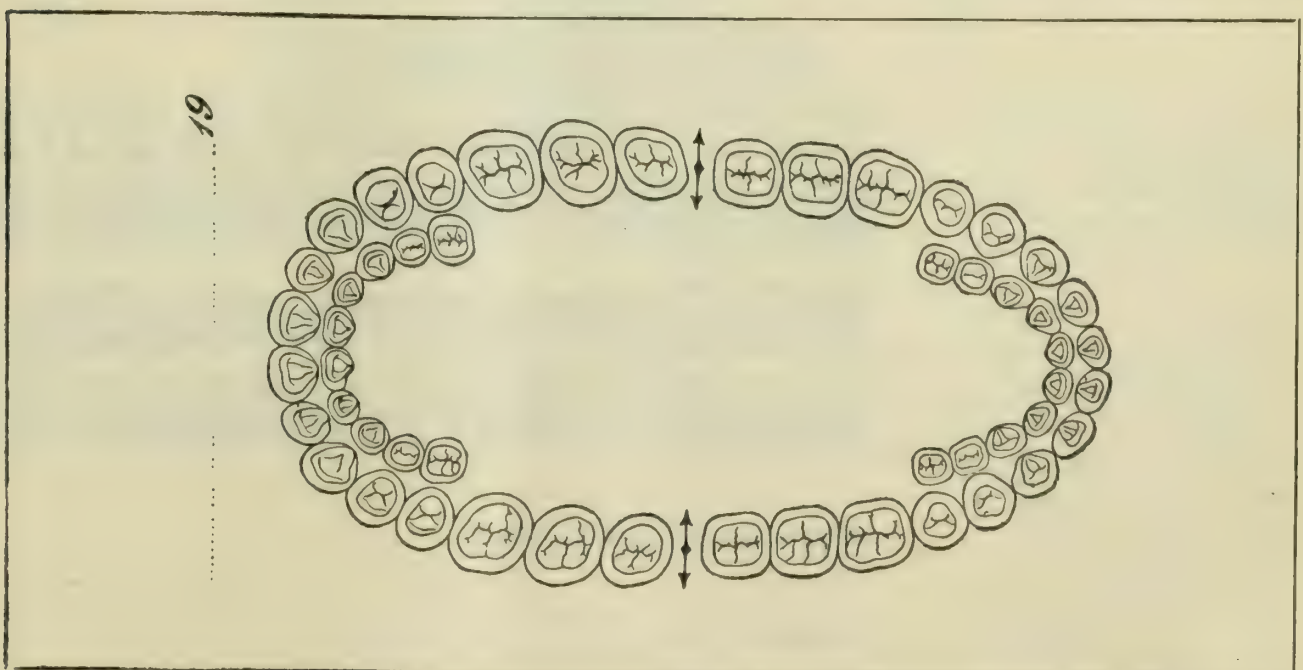
Size, 7 inches wide by $8\frac{1}{2}$ inches long. Put up in tablets of 100.

Price per tablet \$0.60

Diagram Number.

[illegible]

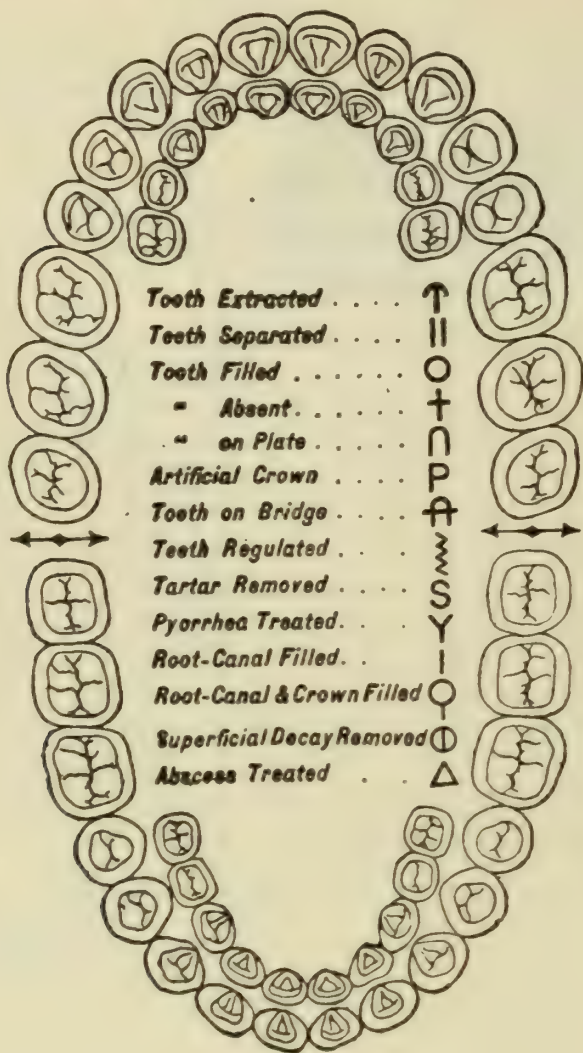
MEMORANDUM BLANK No. 1



The size and style are shown by the diagram. Plain backs. Size, $4\frac{5}{8}$ x $2\frac{3}{4}$ inches. 100 in a tablet.

Price per tablet \$0.20

EXAMINATION



EXAMINATION
BLANK No. 2

The diagram is similar to that used in the Improved Allport Dental Ledger, showing the symbols used to facilitate rapid book-keeping. The reverse side is made up in the form of a memorandum account, whereon any desired entries can be made to be afterward transferred to the Ledger.

Size, 5 $\frac{3}{8}$ x 3 $\frac{1}{4}$ inches. Put up in tablets of 50 each.

Price...per tablet \$0.20

EXAMINATION
BLANK No. 3

The illustration of the teeth used in the No. 3 Examination Blanks is a reduced facsimile of that in the Improved Warren Dental Ledger. The outlines show the size and style of the blank. Size, 3 $\frac{3}{4}$ x 3 $\frac{3}{4}$ inches. Put up in tablets of 50. Each blank readily detached without interfering with the others.

Price...per tablet \$0.20

Date_____190



Examination of M_____teeth.

Remarks:_____

The NEW MODEL Wilkerson Chair

Patented in the United States: Aug. 30, 1887; Oct. 4, 1892; May 15, 1894 (Nos. 519,756 and 519,757); April 27, 1897; Jan. 30, 1900 (Nos. 642,404 and 642,405); Dec. 4, 1900. In England: Oct. 4, 1892; May 17, 1894; April 27, 1897; Oct. 9, 1899. In Canada: Jan. 2, 1900. In Germany: D. R. G. M. Nos. 74,667; 74,668; 125,095; 125,096; 125,097.



When you own a New Model Wilkerson Chair you are certain of one thing,—nobody else can get a better chair. It is the summit of present achievement in dental chairs. No other even approaches it in all-around utility and beauty. Its movements are noiseless, quick, certain. Every adjustment of the chair body is effected by the foot or leg of the operator,—one lever does it all. It gives every position to facilitate operating. Every line is graceful and reposeful,—it seems to invite the patient to rest.

PRICES

Finest Maroon or Green Plush.....	\$200.00
In Finest Green or Maroon Plush, puffed with Plush trimmed with Silk Cord, with Wilton Carpet.....	220.00

BOXING FREE

The WILKERSON Dental Chair

Patented August 30, 1887; October 4, 1892.

Patented in England, October 4, 1892



A quarter of a century of large sales is one recommendation of the Wilkerson Dental Chair. Some of those sold in the earlier days still in active, satisfactory use is another. Both of these follow from a third, its capabilities and its construction. It gives the patient any desirable position, it makes changes easily and quickly, and it is built to stand the wear of every-day service. In no other chair can you get so much for so little money. Leg Base (as shown) or Disk Base.

Prices with Disk or Leg Base

In Finest Green or Maroon Plush.....	\$125.00
In Finest Green or Maroon Plush, puffed with Plush, trimmed with Silk Cord, with Wilton Carpet.....	145.00

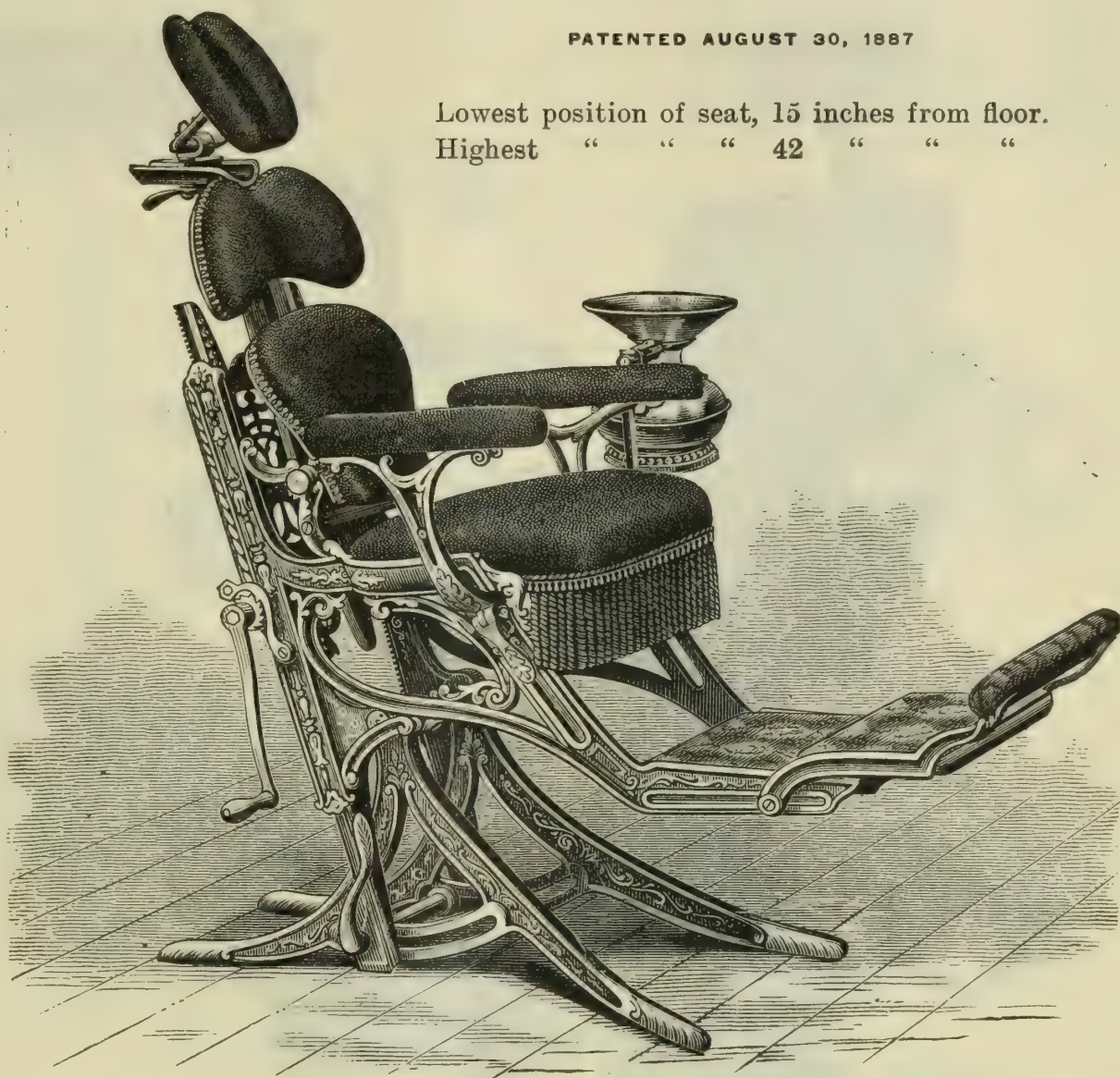
With Watkins Sectional Head-rest, instead of regular Head-Rest as shown, adds \$10 to these prices.

BOXING FREE

THE MORRISON DENTAL CHAIR

PATENTED AUGUST 30, 1887

Lowest position of seat, 15 inches from floor.
Highest " " " 42 " " "



EXTRAORDINARY RANGE

The Morrison Chair has extraordinary vertical range of movement and ease and rapidity of action. Owing to its great range, the dentist can operate with equal convenience whether sitting or standing.

ADJUSTABLE BACK PADS AND ARMS

The lower back-pad can be adjusted to the small of the patient's back, and the upper one raised, lowered, or entirely removed, as in operating for children.

The arms can be lowered so as to be entirely out of the way of the operator, or they can be clamped in intermediate positions.

RECLINING MOVEMENT

The Chair has a reclining movement, and it may be securely clamped in any position by slight pressure on the foot-lever. The foot-rest has a wide range of movement, and can be adjusted by either operator or patient.

PRICES

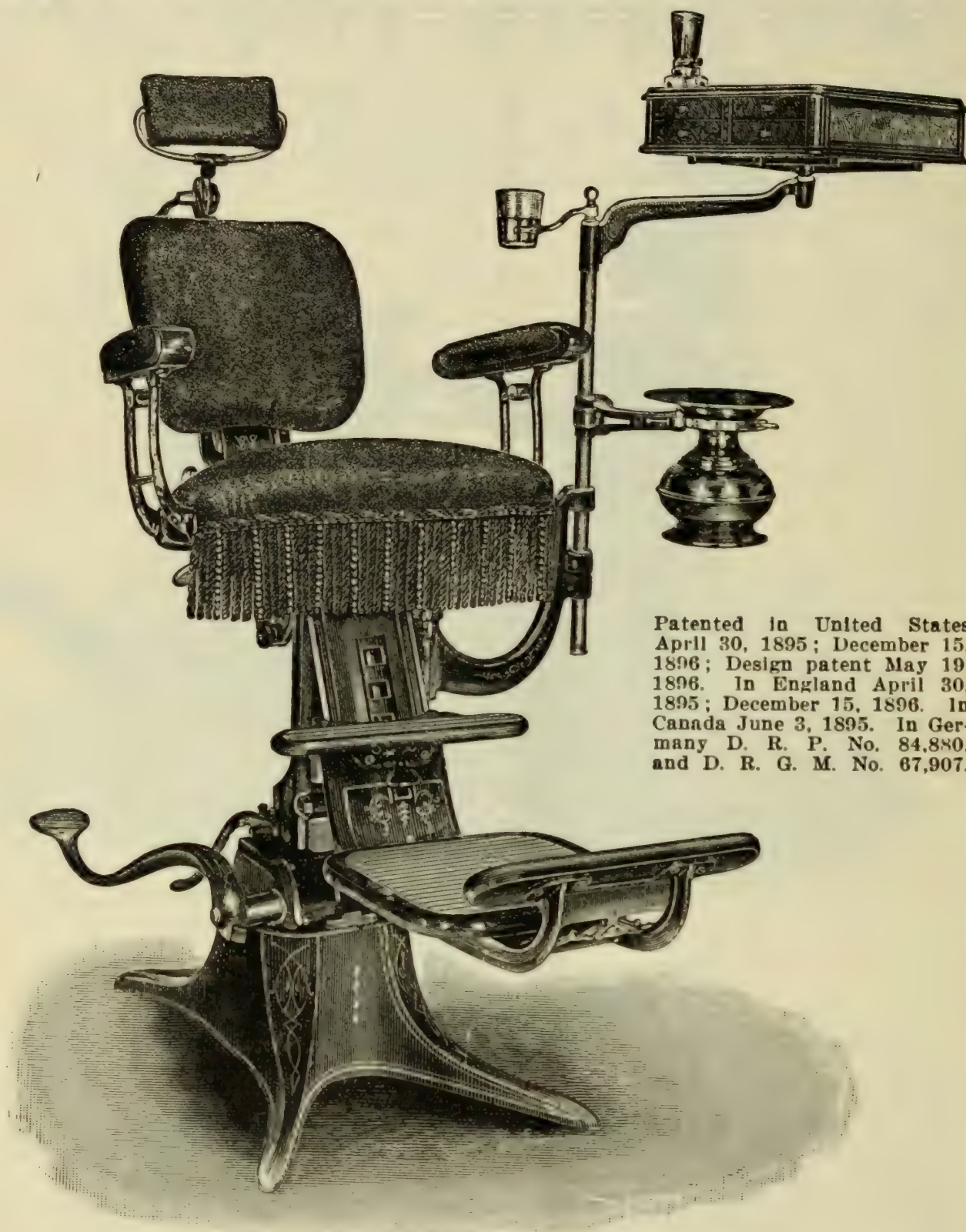
In Corded Upholstery (Student's Morrison)	\$76.00
In Finest Green or Maroon Plush	90.00
In Finest Green or Maroon Plush, puffed and trimmed with Plush	110.00

The illustration shows No. 4 Cuspidor, No. 4 Bracket, No. 3 Socket, which are extra, and add \$7.00 to the above prices.

Watkins Sectional Head-Rest instead of regular Head-Rest shown, adds \$25.00 to the above prices.

BOXING FREE

Duplex Lift Dental Chair With Combination Attachment



Patented in United States
April 30, 1895; December 15,
1896; Design patent May 19,
1896. In England April 30,
1895; December 15, 1896. In
Canada June 3, 1895. In Ger-
many D. R. P. No. 84,880,
and D. R. G. M. No. 67,907.

THE LOWEST-PRICED HYDRAULIC LIFT CHAIR ON THE MARKET

The Duplex Lift Chair, with the smoothest and easiest pumping device ever applied to a dental chair, lacks no movement or adjunct essential to the comfort of the patient or the convenience of the operator.

With the Chair in its highest position, the tallest operator and the smallest patient can be accommodated. In its lowest position the dentist may sit in a common chair and operate much more comfortably than if tilted on a high stool.

The Head-Rest automatically adjusts itself to the comfort of the patient, so that in every position of the Chair the head rests easily.

Price, in Finest Green or Maroon Plush Upholstery\$85.00
" " Corded Upholstery 80.00

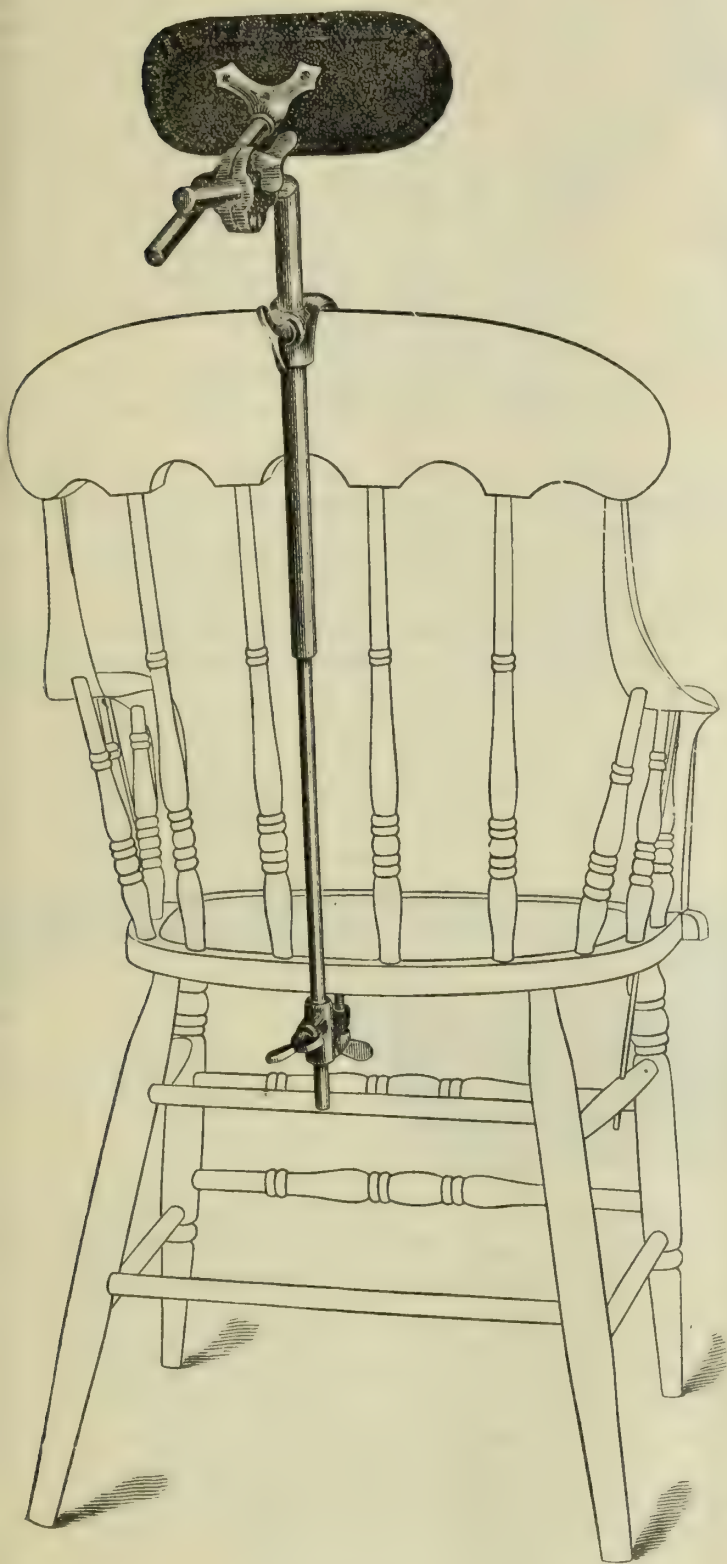
Combination Attachment, with Plain Allan Table and No. 4 Cuspidor, as illustrated, adds \$26.00 to prices of Chair.

Watkins Sectional Head-Rest, instead of regular Head-Rest shown, adds \$25.00 to the above prices.

BOXING FREE

THE S. S. WHITE PORTABLE HEAD=REST

(Improved)



May be attached to almost any chair.
Free and full movement in all directions.
Up-and-down range, 8 inches.
Suits a tall man or a small child.
Holds its place without movement.
Affords firm support.
Substantially made, nicely finished—all exterior metal parts nickel-plated; upholstered in green or maroon plush.

Weighs 5½ lbs.; packs in box 16¼ x 9½ x 4½ inches; box fitted for repacking.

Price\$12.00

TEMPORARY GUTTA=PERCHA CAP=CROWNS

Suggested by DR. T. M. HUNTER

FIG. 1

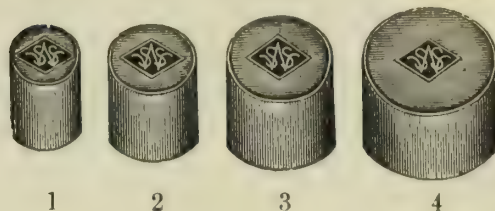


FIG. 2

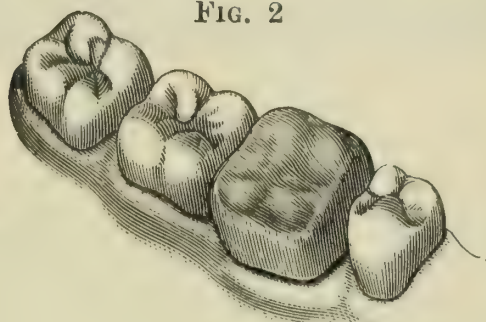
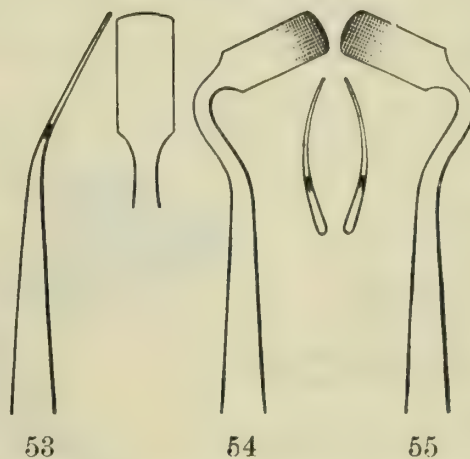


FIG. 3



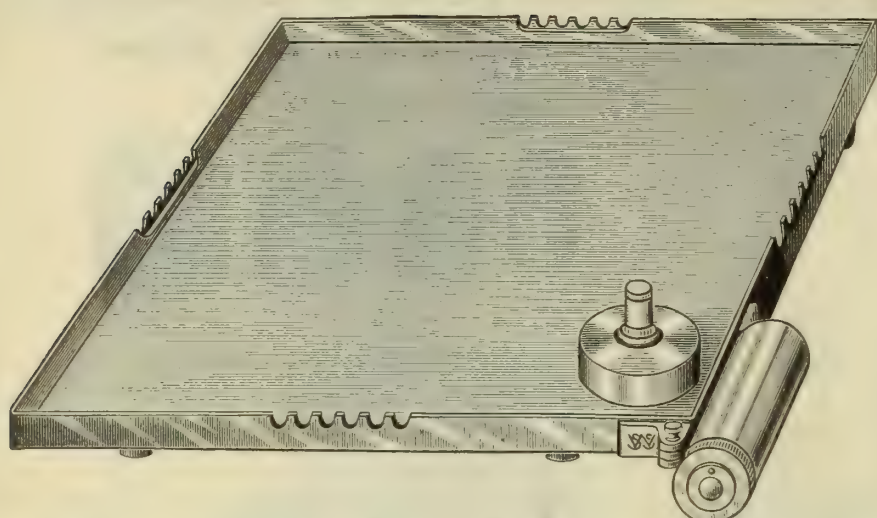
For the protection of teeth prepared for crowning against agencies which would irritate them and make their sensitiveness unbearable. The gutta-percha surface is soothing, and the Cap-Crown perfectly fends off cold draughts of air, acids, etc. These Cap-Crowns also afford an unequalled means of retaining medicaments in treatment or devitalization, especially in coronal exposures or in abrasion. Fig. 2 shows a cap in place on a molar tooth.

The instruments shown in Fig. 3 were devised for quickly molding and adjusting the Gutta-Percha Cap-Crowns on the teeth. They possess so many points of merit that we have incorporated them in our set of plastic filling-instruments as Nos. 53, 54, 55.

The Gutta-Percha Cap-Crowns are made in four sizes and put up in boxes containing one dozen, assorted sizes.

Gutta-Percha Cap-Crowns...	per box	\$0.50
Instruments, Long Handle, Nos. 53,		
54, 55	each	.50
Instruments, for Cone-Socket Han-		
dles, Nos. 53, 54, 55.....	each	.35

The S. S. White Aseptic Bracket Table



This Table is cleanly, and handsome, and can be sterilized readily. Another claim for recognition equally important is its helpfulness. It carries the instruments and other operative appliances so that they at least appear to be handier. You have only to think the instrument and it stands out distinctly before you. This is because of the glass surface against which it rests, which brings it out in bold relief. Then, again, intelligent patients are fast acquiring a knowledge of sterilizing, asepticism, etc., and they recognize with pleasure and appreciation any appliance which shows progress in that direction.

A glass plate, sufficiently heavy and tough to stand any reasonable usage, is held in a metal frame, which is supported in the usual manner of our Bracket Tables.

The glass is ground on one side, plane polished on the other, perforated in one corner for the reception of a pivot supporting a Capital lamp. Either face may be turned upward, and it is easily removed from the frame for sterilizing. Size in the clear, 12 x 12 inches.

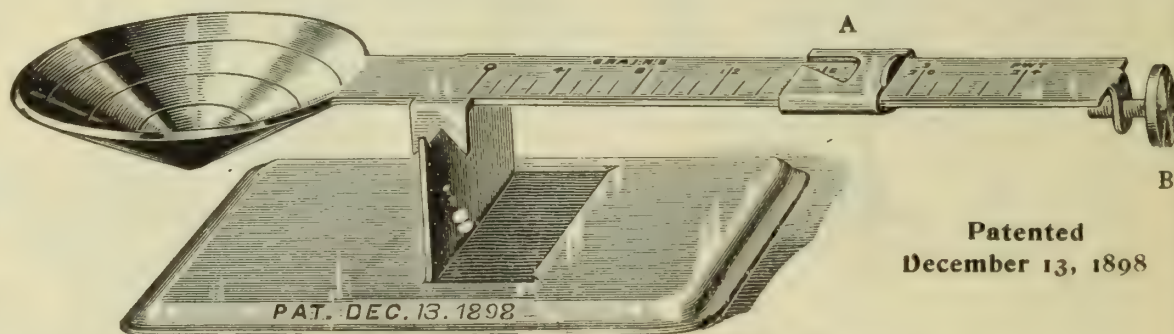
The frame is nickel-plated, with racks formed on each side to support instrument handles and keep them from rolling. At one corner a handy cotton-holder is attached.

This table ought to have a large sale among operators who appreciate neatness and plain, quiet beauty. Its chaste design and handsome finish impart a dignity to its appearance which cannot fail to attract, while its usefulness will make a warm friend of its owner.

Price, including Lamp and Cotton-Holder..... \$15.00

The Alloy Balance

Invented by
DR. M. G. WHEELER



Patented
December 13, 1898

The Alloy Balance is a simple, handy appliance affording the means for making the proportions of alloy and mercury in mixing amalgams as exact as is desired. It makes the mix definite, and in so far complies with the now pretty well understood idea that definite results are obtainable only from definite mixes.

The beam works on a knife-edge, and is graduated in half-grains from 0 to 24, a sliding poise A indicating the exact weight. An adjusting screw B provides for the level balancing of the beam with the poise at zero. The pan is cone-shaped, with a series of concentric lines. In using this Balance the alloy should be in the center of the pan for greater accuracy. The mercury will of course center itself. The beam with the pan is readily lifted to empty the pan. The capacity of the pan is 24 grains of alloy, enough for most large fillings. If a larger quantity is required, two weighings will accomplish it.

The illustration is natural size. The Balance is finely nickeled, and so is safe from the action of mercury.

Price \$0.60

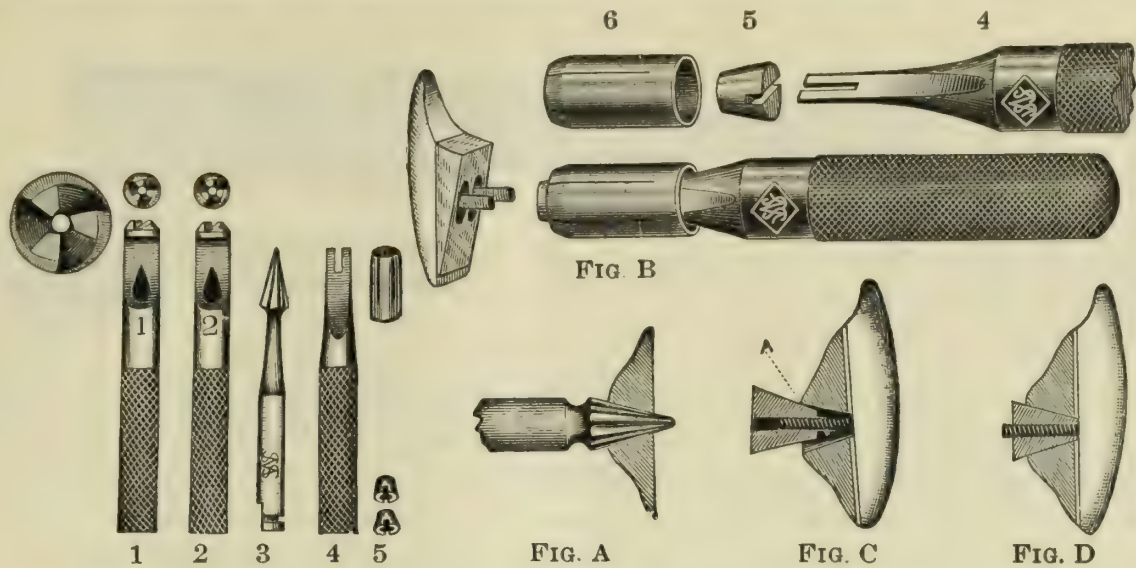
Sizes of Pellets



These diagrams of approximate sizes of amalgam pellets of the weights given,—mortar mixed and pinched between thumb and finger to express the surplus mercury,—are offered as an aid in estimating the bulk and weight of a mass of amalgam sufficient to fill a given cavity, and thus to help in the avoidance of waste in mixing.

BRIDGE-REPAIR TOOLS

Approved by DR. E. A. BRYANT, Inventor of the original set



The idea in the use of this set of Bridge-Repair Tools is to fasten the repair tooth to the bridge by means of a threaded nut.

In brief, the method is to select the facing or crown to be attached, clip off the pins from the bridge, and smooth the backing to a flat surface. Drill two holes, size of the pins of the tooth, through the backing, and countersink them with the reamer. Fit the facing; cut threads on the pins. Putting the tooth in place, start first one nut, then the other with driver, using the holder to keep them in place. Screw up the nuts alternately, to avoid stripping the threads, until both are seated firmly. Then grind off the protruding parts and finish.

The set consists of two screw-cutting dies, a reamer, a nut-driver and holder, and two gold nuts. The larger of the two dies, No. 1, is for starting the thread on the pins of the repair tooth, which is completed with the smaller die, No. 2.

No. 3 is a reamer, for shaping the holes drilled in the backing to receive the pins; the reamer corresponds in its taper to the nuts (No. 5).

No. 4 is a nut-driver with a holder for keeping the nuts in position till they are started on the pins. The nut-driver is now made for use in the right-angle, as well as for operation by thumb and finger.

All the instruments are operated with the thumb and forefinger, except No. 3, which is to be used in the Right-Angle of the Engine, and the Right-Angle Driver.

The numbered illustrations show the size of the appliances, the lettered figures make plain the manner of using them.

Quick and strong bridge repairs may be made with these tools. Teeth can also be set in the manner indicated in new work to make them easily removable.

In ordering state for which Right-Angle the Reamer No. 3 is wanted.

PRICES

Nos. 1 and 2. Tooth-pin Dies.....	each	\$0.75
No. 3. Right-Angle Reamers	"	.25
" 4. Nut-Drivers with Holder, either style.....	"	.25
" 5. Gold Nuts	"	.50
The Set in box containing one each of Nos. 1, 2, 3, 4, and two of No. 5.....		3.00

Daintree's Adjustable Mouth-Prop

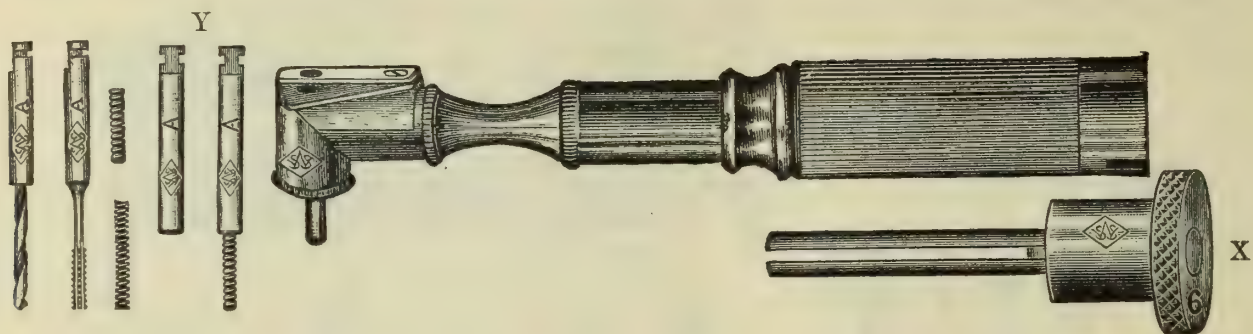
Patented September 10, 1889

This Mouth-Prop combines facility of lengthwise adjustment to suit the "open" of the jaws with a spring which affords the necessary elasticity. With the spring compressed the length of the shortest adjustment is $1\frac{3}{16}$ inches; at the longest, $1\frac{1}{2}$ inches. One head screws into the body, around which the other swivels, an elastic spring being confined between the swiveling head and the body. The heads are cushioned with cork, and there is a ring for the attachment of the retaining cord.

Price, Nickel-plated..... \$0.75



The SCREW-POST ACTUATOR



Every dentist among the thousands who use the How Screw-Posts will welcome the Actuator here described because it simplifies the setting of the posts in posterior teeth. The Actuator (X) is a device for operating the No. 2 Right-Angle Attachment by hand. It is passed into the rear of the Attachment, with the split shank over the connecting-bit, and turned with gentle pressure until the milled head comes flush against the sleeve of the Attachment. The Actuator will then have engaged with the connecting-bit, so that it will actuate the head mechanism of the Attachment. The chuck carrier Y, which has an interior thread to fit the screw-post, is then fixed in the head exactly as in the case of a right-angle bit.

The root is first engine-drilled with the Right-Angle drill for a short or long section of the post. Then the corresponding tap is put in the Right Angle and the Actuator turned with thumb and finger to cut the thread in the root.

The tap is next replaced by the chuck, into which the post section is inserted, then seated in the root by a few turns of the Actuator, and left firmly set by turning the Actuator to the left. The Right-Angle drills may be operated by the Actuator, but the engine action is quicker.

There are three sizes of the carriers, AA, A, and B, corresponding with the drills, taps, and screw-posts of the How system.

The Actuator is made in two styles,—No. 6 for the Angle Attachment for No. 6 Hand-Piece; No. 7 for Attachments of Nos. 7 and 8 Hand-Pieces.

The device will be found a real help in the setting of screw-posts for all purposes, whether for anchorages for fillings, cap crowns, or bridge piers, at any angle at which they may be required.

PRICES

Actuator No. 6 or No. 7.....	\$0.75
Screw-Post Carriers, AA, A, B.....each	.15

RIGHT-ANGLE DRILLS and TAPS



As used in How's Retaining-Screw Process

Retaining screws in posterior or other large cavities in bicuspid and molars are best inserted by first using the Right-Angle Drill with the engine and then using the Actuator described above to cut the thread and insert the post.

PRICES

Drills, AA, A, or B.....each	\$0.30
Taps, AA, A, or B.....	.50

SCREW-POSTS

The How Screw-Posts are made of three sizes, AA, A, and B, and in Gold, Platinum-Silver and Crown-Metal.

	No.	Length	Diam.	Threads to inch	Price each
How's 14-K. Gold	AA.....	$\frac{7}{8}$ in.	.051	48	\$0.45
	A.....		.058		.55
	B.....		.065		.65
	Platinum-Silver AA.....	$\frac{7}{8}$ "	.051		.15
	A.....		.058		.15
	B.....		.065		.15
Crown-Metal	AA.....	$\frac{8}{8}$ "	.051		.50
	A.....		.058		.60
	B.....		.065		.70

AA A B
B with Nut

Gem Disks, Points, Wheels, and Cups

Gem appliances are rapid cutters and work well wet or dry—rather better dry. They wear well and can be used till worn down close to the mandrel.

They should always be mounted with cement, as shellac would be liable to be melted by the heat when they are run dry.

Gem Disks and Wheels, to be genuine, should be under our unbroken label.

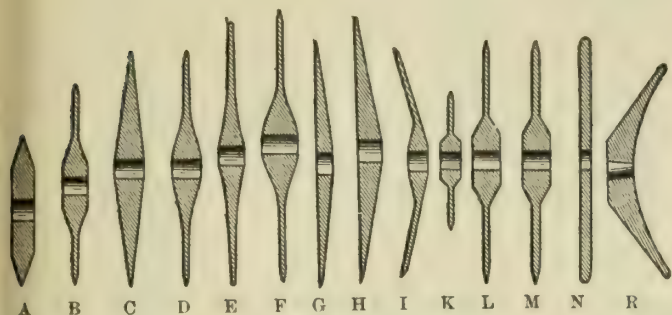
GEM DISKS

These Disks were designed for general use in making separations between the teeth, excepting R, a cup shape, especially valuable for crown- and bridge-workers.

Can be used on Mandrels Nos. 302, 303, 304, 313, and 319 A. Unmounted, put up singly in envelopes; mounted, singly in boxes.

PRICES

A to N, and R, not mounted...each \$0.07; per doz. \$0.75
 " " " " " mounted " .15; " 1.75

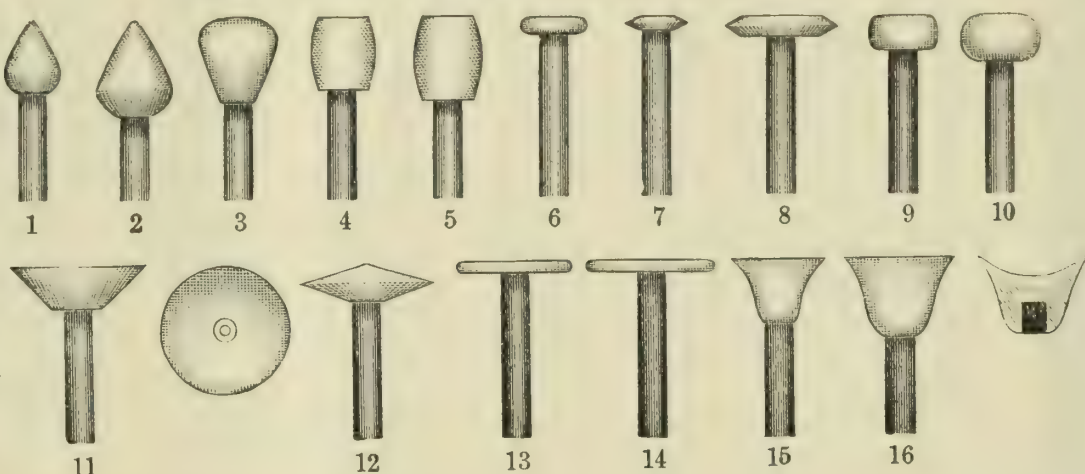


GEM POINTS

Any part of any tooth in the mouth can be reached for trimming or cutting by some one of the points here offered. Can be used on Mandrels, Nos. 300, 301½, 301½, and 319 B.

PRICES

	Each	Doz.
Nos. 1 to 16, not mounted	\$0.04	\$0.40
Nos. 1 to 16, mounted	.12	1.40



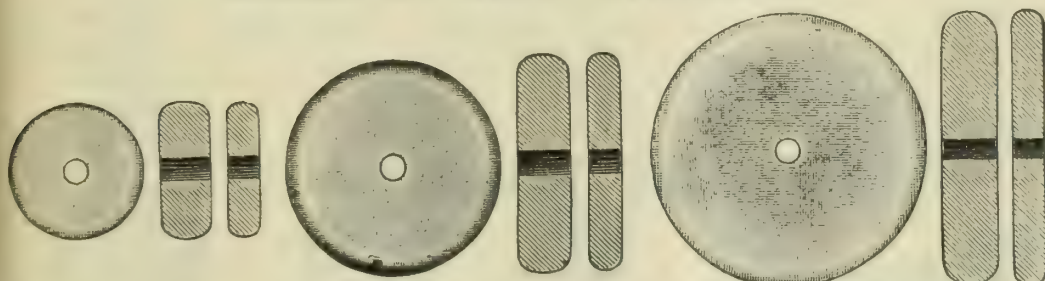
GEM STUMP WHEELS

For the preparation of roots for pivoting, and for cutting off projections of natural teeth. Three sizes: ½ inch, ¾ inch, and 1 inch in diameter; the thicknesses are shown in the sectional illustrations.

Unmounted, put up singly in envelopes. Mounted, put up singly in boxes.

PRICES

	Each	Per Doz.
Unmounted	\$0.07	\$0.75
Mounted	.15	1.75

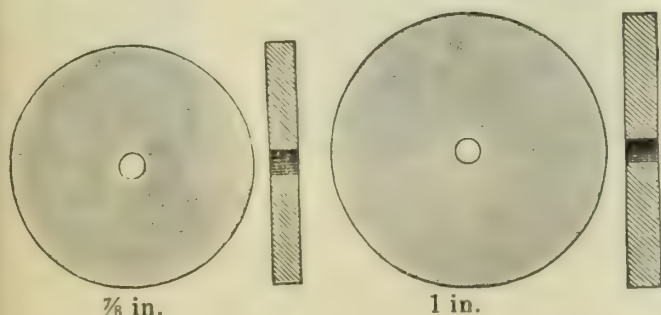


GEM CROWN WHEELS

For shaping roots to receive crowns and for trimming crowns to fit roots. Made safe-sided by the use of Bright Metal Shields, price for shields, each \$0.05.

Two sizes, ¾-in. and 1-inch diameter.

Price, either size	each \$0.07
" " "	per doz. .75



GEM CUPS

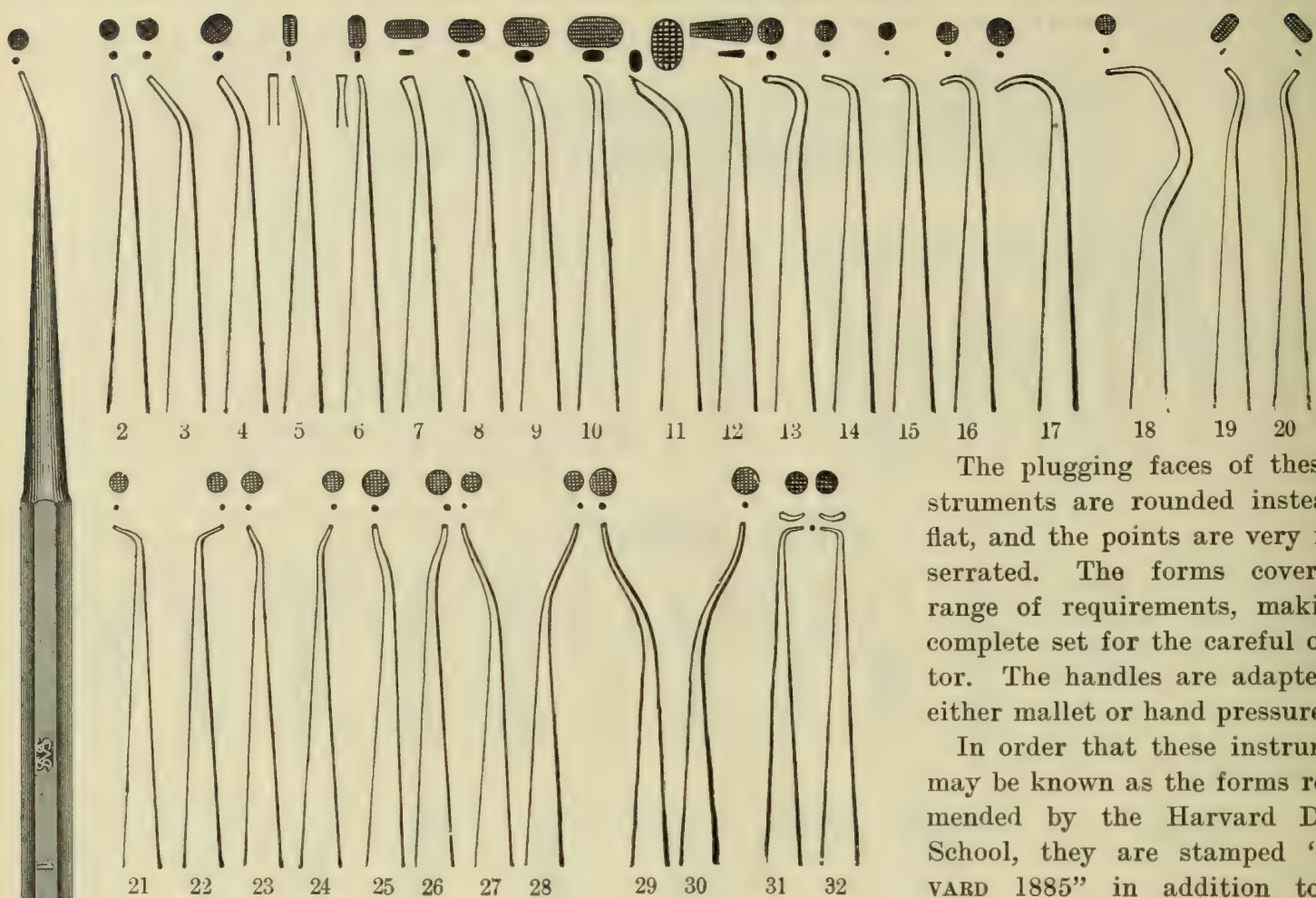
The concave and convex grinding surfaces of the Gem Cup offer an effective and convenient means for trimming and shaping teeth and in preparing roots for crowns. Used on Mandrels 302, 303, 304, 313, and 319A.

Price, Not mounted	each \$0.04; per doz. \$0.40
" Mounted	" .12; " 1.40



HARVARD PLUGGERS

Adopted by Harvard Dental School



The plugging faces of these instruments are rounded instead of flat, and the points are very finely serrated. The forms cover the range of requirements, making a complete set for the careful operator. The handles are adapted for either mallet or hand pressure.

In order that these instruments may be known as the forms recommended by the Harvard Dental School, they are stamped "HARVARD 1885" in addition to the number and our trade-mark.

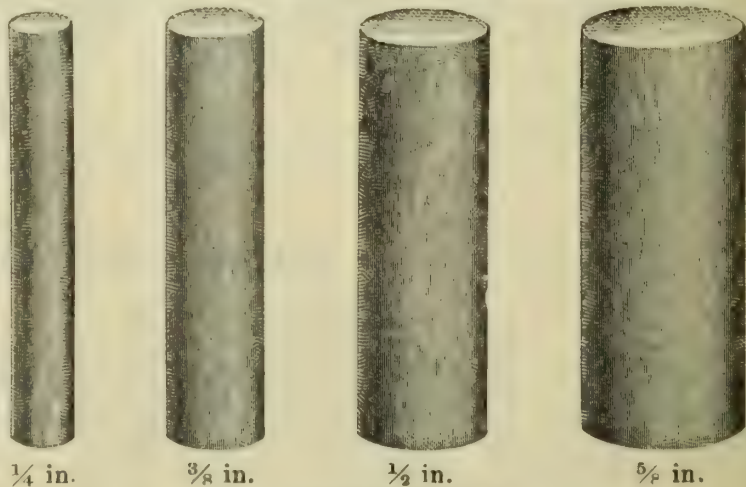
PRICES

Per set of 32.....	\$36.00
SEPARATELY	
Nos. 1, 2, 3, 5, 11, 14, 15, 16, 17.....	each \$1.00
" 19 to 32.....	" 1.10
" 4, 6, 7, 8, 9, 13, 18.....	" 1.25
" 10.....	" 1.50
" 12.....	" 1.75

Made only on Octagon Ball-end Handles.

Absorbent Cotton Rolls

Can be used wherever Absorbent Cotton can be. Thus, two 1½-inch rolls can be laid over the mouths of the ducts of Steno; a 6-inch roll can be placed under the tongue with the ends tucked down beside it, or it can be put outside the lower teeth next to the lip and cheeks. In this last position the roll is also useful as a cushion to guard



1½-INCH ROLLS

against painful pressure on the lower lip in some operations on the upper teeth. Whether used whole or cut in pieces, the edges of the rolls are smooth, with no "fuzzy" fibers protruding.

These Rolls are especially useful in crown- and bridge-operations, and will also advantageously replace napkins in examinations and in those brief operations where it seems hardly worth while to apply the dam and clamp. They are made in two lengths, 1½ and 6 inches long, and of four diameters, about 5/8-in., 1/2-in., 3/8-in., and 1/4-in.

Box of 100 6-in. Rolls, assorted diameters.....	\$0.50
" " 1½-in. " " " ".....	.25

BROWN'S "HEROIC" CHISELS

This set of instruments is designed to do nearly all the heavy trimming away of enamel, both on the exposed surfaces of the teeth and on their approximal surfaces. Several of the points are also valuable for scaling calculus and removing stains.

The forms of the heavy points will explain their uses, for "heroic" chiseling; the thin blades only to be used where necessary on account of limited space between the teeth.

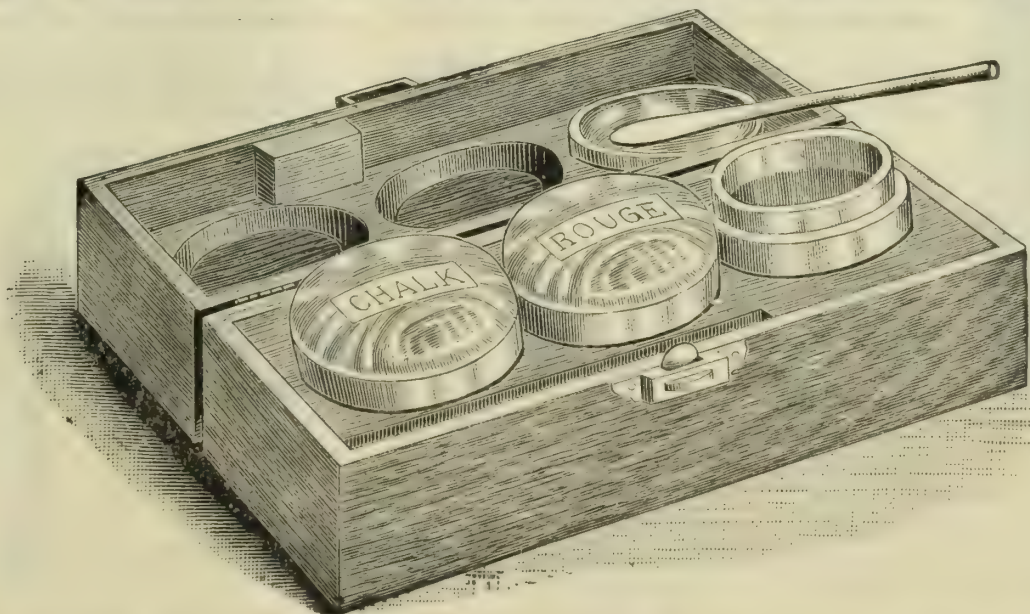
**Made only on Octagon Steel
Handles**

PRICES

Nos. 1, 2, 3.....	each	\$1.50
" 4, 5, 6.....	"	1.60

REDUCED PRICE

OFFICE POLISHING-POWDER CASE



Glass jars with covers keep the powders in good condition, and the covers turned over into the recesses in the lid make the nicest kind of mixing trays, which can be quickly cleaned by wiping out. Three of the jars in a neat wood box with spring catch for the lid. Jars about $1\frac{1}{4}$ x $1\frac{1}{2}$ inches inside measurements; box $7\frac{1}{2}$ x 3 x $2\frac{1}{2}$ inches outside.

PRICE

Complete \$0.75

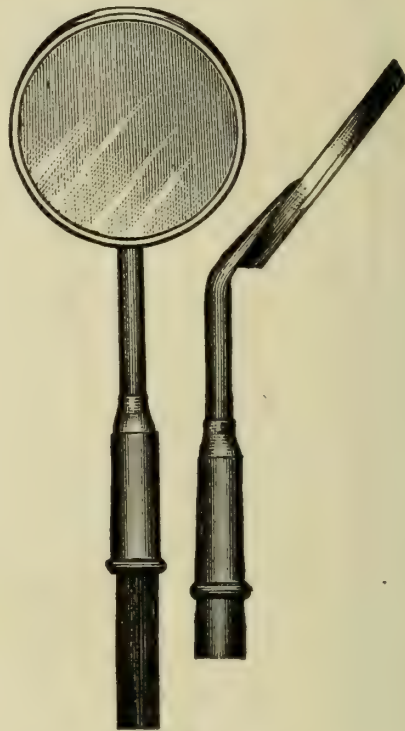
MOUTH-MIRRORS Illustrations Full Size



No. 1 Small



No. 2. Medium



No. 3. Large

Our Ebony Handle Mouth-Mirrors are made with the stem attached to the end of a ferrule about three-quarters of an inch long. Into this ferrule the end of the handle is socketed and securely fixed.

The three sizes, Small, Medium, and Large, are supplied with either plane or magnifying glasses.

PRICES

No. 1.	Ebony Handle.	Plane Mirror (small)		} each \$0.75
" 2.	" "	" " (medium)	.....	
" 3.	" "	" " (large)	.....	
" 4.	" "	Magnifying Mirror, size of No. 1	...	
" 5.	" "	" " " " 2	...	
" 6.	" "	" " " " 3	...	

EXTRA GLASSES

Price, Extra Glasses Nos. 1 to 6.....each \$0.35

SCREW-FRAME MOUTH-MIRROR

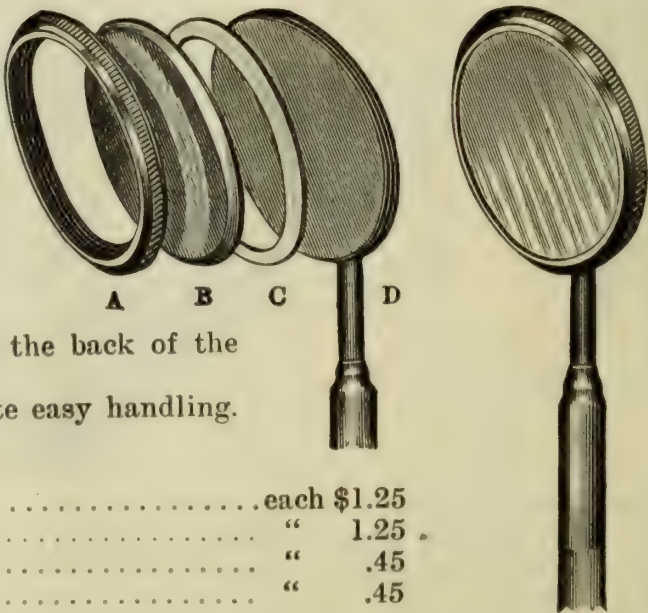
An excellent example of a Mirror which may be easily removed from its frame:

D, the back, the edge of which is threaded to receive screw-ring A.

C, cushion washer, on which rests Mirror B.

A, the screw-ring with overlapping rim, which when firmly seated on back D forms a tight joint, protecting the back of the Mirror from moisture.

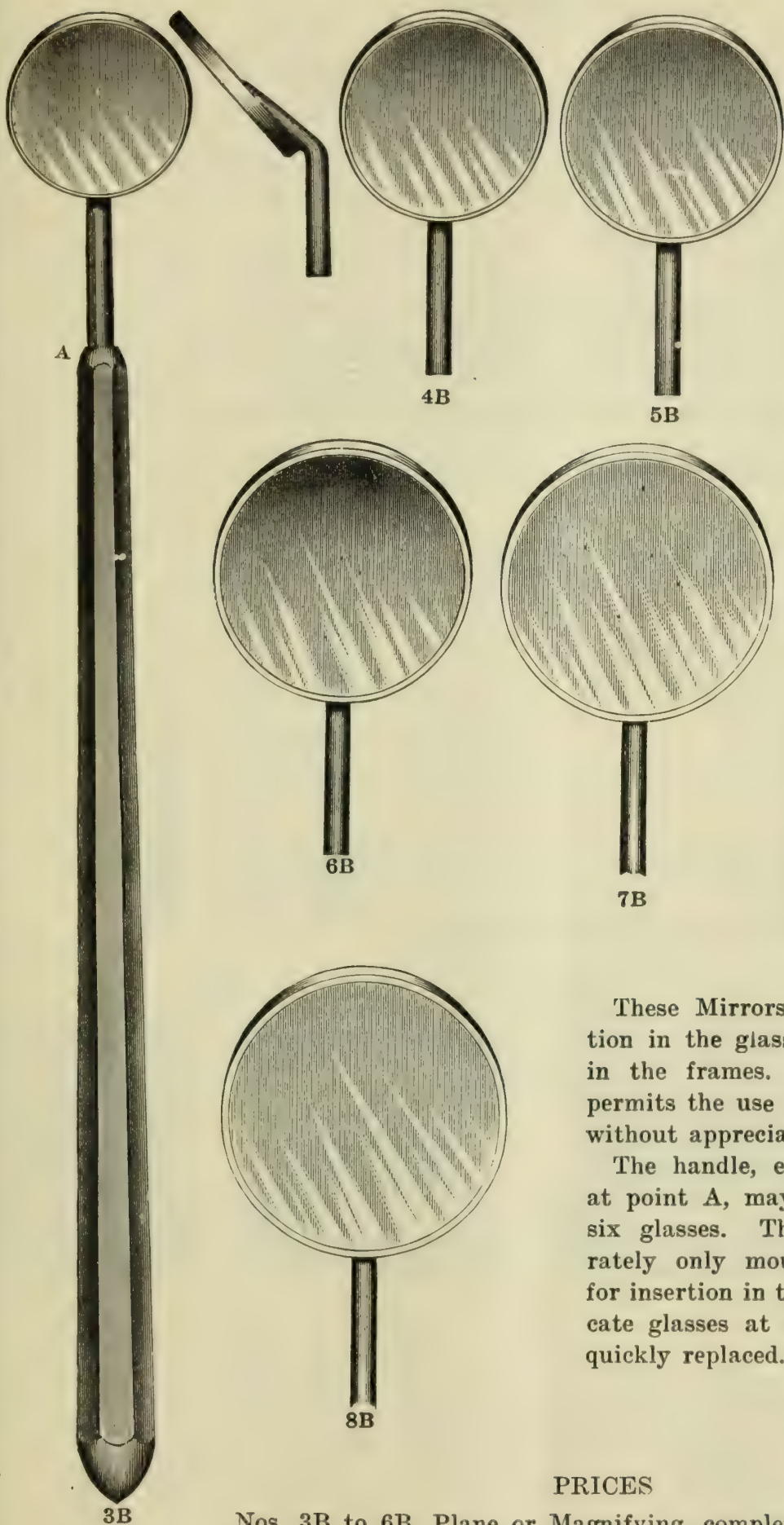
The edge of the screw-ring is milled to facilitate easy handling. Made in one size only. Diameter $\frac{7}{8}$ -inch.



Price, Plane	.....	each \$1.25
" Magnifying	.....	" 1.25
" Extra Mirrors only, Plane	.....	" .45
" Extra Mirrors only, Magnifying	.....	" .45

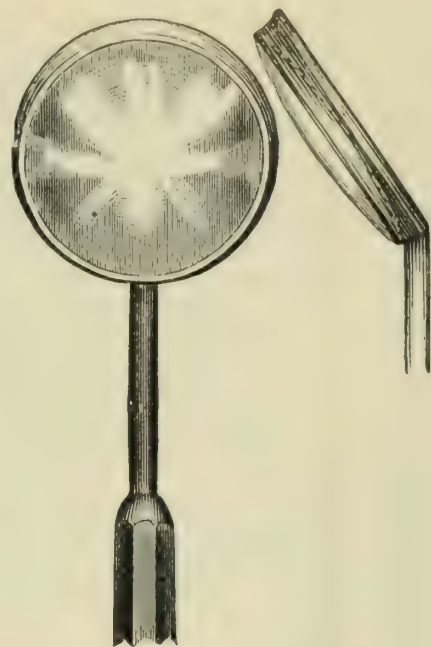
Aluminum Handle Mouth-Mirrors

Plane and Magnifying



Magnifying Examination Glass "A"

With Aluminum Handle



Examination Glass "A"

A fine, clear glass. Focal depth carefully adjusted for oral examinations. It has the new style aluminum handle.

Price\$1.50

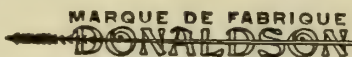
These Mirrors are clear, without imperfection in the glass or coating, and well secured in the frames. The lightness of aluminum permits the use of a conveniently large handle without appreciably increasing the weight.

The handle, easily detached by unscrewing at point A, may be used to hold any of the six glasses. The glasses are supplied separately only mounted, as shown, with stems for insertion in the handles. By keeping duplicate glasses at hand a damaged one may be quickly replaced.

PRICES

Nos. 3B to 6B, Plane or Magnifying, complete	each \$1.00
" 3B to 6B, Plane or Magnifying Glasses with stems.....	" .65
" 7B and 8B, Plane or Magnifying, with handles, complete. "	1.25
" 7B and 8B, Plane or Magnifying Glasses with stems....	" .90

Dr. Donaldson's Root-Canal Instruments

Master  Schutz
MARQUE DE FABRIQUE
DONALDSON
Déposée en France.
Geschützt im Deutschen Reich.

SPRING-TEMPERED NERVE-BRISTLES

The Donaldson Spring-Tempered Nerve-Bristles are very thin and very tough. They are thin enough and have sufficient rigidity to enter any root-canal which is not obliterated; they are tough enough to stand a considerable strain, can be bent almost as the dentist pleases without breaking, they will follow the canal, and they are spring-tempered.

They are "regular" in quality,—one varies little from another; they are dependable all the time.

Made with a sharp hook at the end for removing the pulp, with the end slightly roughened for carrying a shred of cotton for cleansing the canal or for treating an abscess, and with plain end. Supplied with polished vulcanite handles as shown, or without handles for use in the Broach-Holder.

Those with Handles always sent when the order fails to specify the kind wanted.

Put up in boxes or packages of half-dozen as follows:

PRICES

No. 1. Four hooks and two roughened (handles)	} per box	\$1.25
No. 2. All hooks (handles)		
No. 3. Four hooks and two roughened (no handles)	} per pkg.	.75
No. 4. All hooks (no handles)		
All roughened (handles)	} per box	1.25
All plain (handles)		
All roughened (no handles)	} per pkg.	.75
All plain (no handles)		

PULP-CANAL CLEANSERS

The barbs of the Donaldson Pulp-Canal Cleansers are cut regularly in length, in position, and in angle, forming a broken screw-thread, which facilitates the entrance of the Cleanser into the canal, and assists in its withdrawal. Should the Cleanser become "jammed," a backward turn or two will at once release it. The barbs, which project backward, also engage with the pulp-substance, so as to pull it out when the Cleanser is withdrawn.

Made of tough steel piano-wire, with long and short vulcanite handles; also without handles for use in the Broach-Holder.

The long-handled are always supplied when the order fails to specify the kind wanted.

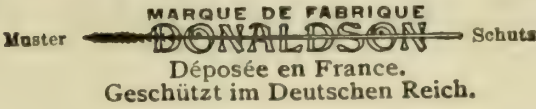
Put up in boxes or packages of half a dozen as follows

PRICES

No. 1. Assorted sizes (handles)	} per box	\$1.75
" 2. All fine (handles)		
" 2. All medium (handles)		
" 3. Assorted sizes (short handles)		
" 3. All fine (short handles)		
" 3. All medium (short handles)		
" 4. Assorted sizes (no handles)	} per pkg.	1.25
" 4. All medium (no handles)		
" 5. All fine (no handles)		
" 5. Extra fine (no handles)		
" 6. Assorted, for Adjustable Holder (no handles) ..		
" 6. All fine, for Adjustable Holder (no handles) ...		
" 6. All medium, for Adjustable Holder (no handles)	} each	.25
"B" Between fine and medium (no handles)		

Gold Nerve Bristles and Pulp-Canal Cleansers

Made by DR. R. B. DONALDSON



These instruments, made of 18-k. spring gold, are tough and springy, and will follow the canal as readily as steel broaches,—perhaps more so. They are not likely to break in use, they do the work of cleaning or medicating the canals effectually, they will not corrode, and they may be sterilized by boiling in water without risk of rust.

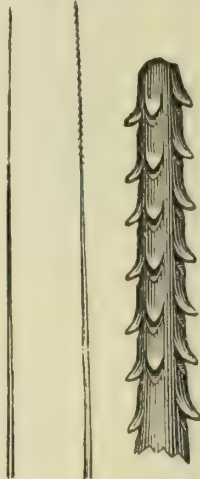
The Gold Nerve Bristles are only made in the plain form (without hook). The Gold Pulp-Canal Cleansers are cut in the same way as those of steel, the barbs forming a broken screw-thread, permitting them to be readily withdrawn from the canal by a backward turn when jammed.

Both Bristles and Cleansers are $1\frac{3}{4}$ inches long, and they can be used in the Donaldson vulcanite handle or in the usual nerve-broach holders.

The Gold Nerve Bristles are made of three diameters,—fine, medium, and large,—without handles, and put up in packages of 6, either fine, medium, or large, but not assorted.

The Gold Pulp-Canal Cleansers are made of three diameters,—fine, medium, and large,—without handles, and put up in packages of 6, assorted and fine.

Nerve Bristles Pulp-Canal Cleansers

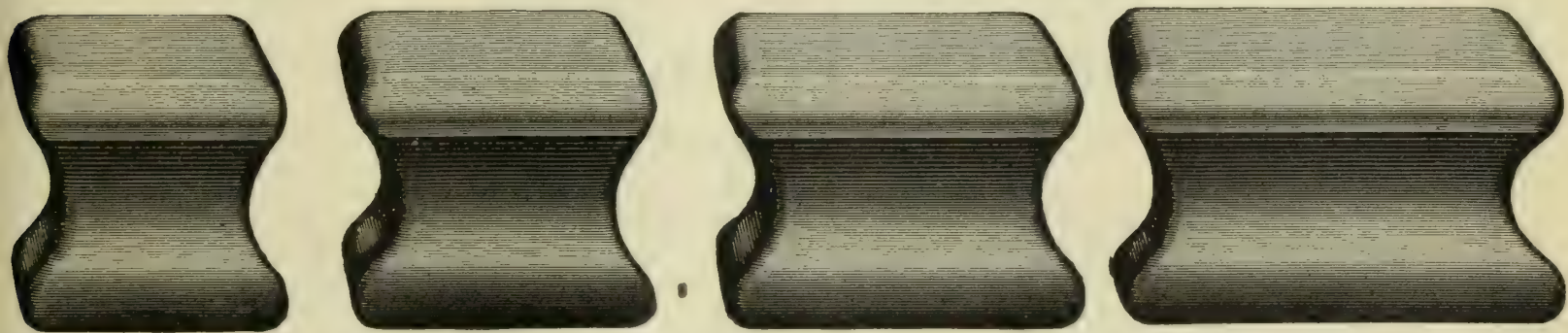


PRICES

18-k. Spring Gold Nerve Bristles.....	per package \$3.25; each \$0.55
“ “ “ Pulp-Canal Cleansers	“ 3.50; “ .60

Soft Rubber Bite-Blocks

Patterns supplied by DR. S. H. GUILFORD



1

2

3

4

The four Soft-Rubber Bite Blocks illustrated herewith, besides affording a variety of sizes sufficient to cover all requirements, have the following advantages:

1. Being elastic, they cannot injure the frailest tooth by being bitten upon.
2. Their resilience opens the jaws if partially closed, as soon as muscular relaxation occurs.
3. Being grooved, they cannot fall into the mouth or be pressed out of place by the tongue.
4. They cannot pass back into the pharynx or be swallowed, or be broken or injured by biting.
5. They do not need a string attached, and are readily removed with the crooked finger.
6. Each block can be set at two heights, and can be placed at any point between the jaws without likelihood of slipping.

Price each \$0.25

TRADE
MOSS FIBRE GOLD
MARK

REGISTERED No. 32,538



A Bit of Moss Fibre Gold Magnified 100 Diameters

A brief study of the illustration of Moss Fibre Gold will show why it is the most satisfactory preparation before the profession. The fibers are long,—the longest known,—and in the mass they are interlaced or interwoven all through each other. Every little fiberlet is instinct with cohesiveness. You have here the ideal conditions for quickly producing the densest homogeneous filling. That is how Moss Fibre works and how it results. It works so easily that one may grow careless. Don't do it. Give it only the same care as ordinary foil, and you will have a dense filling, of uniform texture throughout, with the hardest, most resistant surface of which gold is capable.*

Price	per $\frac{1}{8}$ oz.	\$4.25
"	" $\frac{1}{4}$ "	16.50
"	" 1 "	33.00

Many men have become confirmed users of Moss Fibre Gold through buying a trial package (12 grains) for \$1.00. Its superiority over other forms is convincing.

Anchoring the Filling Without Pits or Grooves

The safe anchorage of gold fillings, it has been shown, does not necessarily require the drilling of a retaining-pit. Just as secure anchorage can be secured with Aura-Percha, with the added advantage that the tooth doesn't have to be weakened to do it.

What is the purpose of "anchoring"? Simply to prevent the first pieces of gold from rocking until enough of it has been packed into the cavity to prevent movement.

With a pellet or two of Aura-Percha you tack the first piece or pieces of gold to the floor at the point you wish to begin the filling, and then go on and add the rest. There's just as much certainty, just as much security, as if you had drilled a pit or gouged out a groove.

Aura-Percha is non-irritant; makes an excellent lining for cavities to be filled with amalgam, or it can be used as a pulp-capping.

Put up in bottles ready for use. Each bottle contains enough of the preparation to anchor more than 500 fillings.

Full directions accompany each bottle.

Price	per bottle	\$1.50
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THE S. S. WHITE DENTAL MFG. CO., Sole Agent

MERCURY

The Mercury which we sell is pure, as pure as it can be made. It has to be, if not chemically pure, so near it that the impurities escape very searching tests. You can use it with the certainty that it will not make the amalgam "dirty."

Put up in quarter-pound packages, bottles and wood holders. Bottles are packed safely for shipment.

PRICES

Per bottle\$0.50

$\frac{1}{4}$ pound in Holder..... .50



$\frac{1}{4}$ Pound in Wood Holder

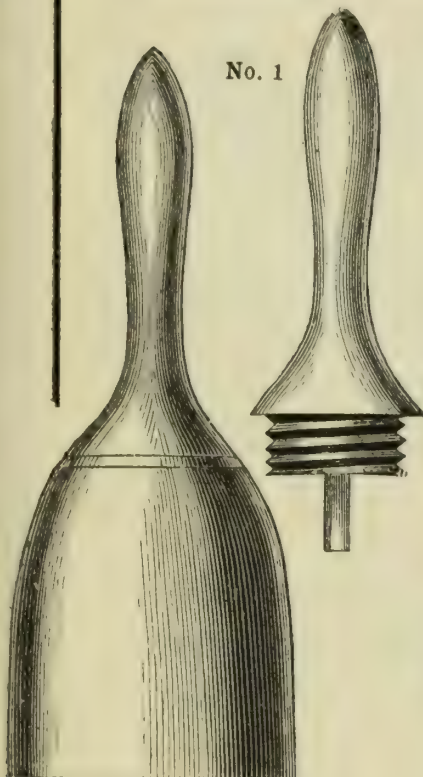


$\frac{1}{4}$ Pound in Bottle

MERCURY HOLDERS

Patented July 18, 1899; D. R. G. M. No. 116,851

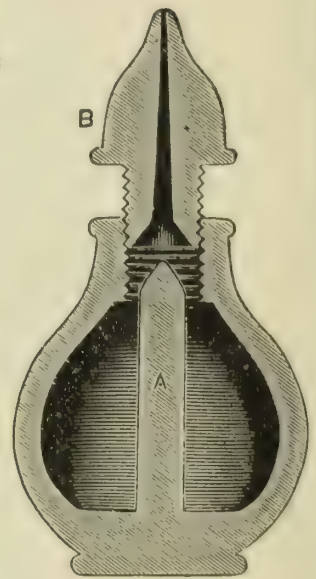
No. 1



No. 2



No. 3



No. 1.—Made of hard wood. A small opening through the tube allows the mercury to escape in a very fine stream. A plug at the lower end of the tube prevents its escape when not in use. Holds 2 ounces.

Price No. 1, Empty\$0.25
 " " 1, Filled 50

No. 2.—Made of ebonized wood and boxwood, with screw cover. The cover is perforated for the delivery of the mercury, and has a screw-cap to close the aperture when not in use. Holds 2 ounces.

Price No. 2, Empty\$0.50
 " " 2, Filled 75

Our No. 3 Mercury Holder will hold the Mercury securely, in case it is accidentally tipped over, and it is so constructed that when opened for use, a mere turn of the screw-cap closes it tight.

The cap B, which screws into the neck, is perforated, the bore tapering to the nozzle. At the inner end of the cap the bore is flared, forming a sort of funnel and also a seat for the coned end of a post, A, extending from the center of the bottom of the Holder a short distance into the neck. The working of the screw-cap upon the coned end of the post forms a valve, which when closed will effectively prevent the accidental loss of mercury. The form of the valve gives easy control of the flow of the mercury. A slight turn of the cap to the left opens the valve and allows the mercury to discharge; to the right closes it.

Made in boxwood and ebonized woods. Holds 2 ounces.

Price, Boxwood or Ebonized Wood, Empty\$0.50
 " " " " " Filled 75

ALLOYS for AMALGAMS

The line of Alloys which we make is headed by one which has been before the dental public only a little more than three years, yet in that time has attained a greater sale than any other. The list ends with one which has had a vigorous life of more than twenty years. Between the two are Alloys which have been considerable factors in the filling of teeth for various periods, from nine to forty-eight years.

Every one of these has distinctive merits. Each of them maintains its place because there is a demand for it. This demand is from men who have used them and find qualities in them which makes them want more.

TRUE DENTALLOY

At least equal in every quality which makes an Alloy valued, to any other made after Dr. Black's method, no matter what the price or claims. Fine cut, with definite combining proportion with mercury, makes an Amalgam which gives a strong breaking, crushing, and "flow" test. White in color. Expands slightly during early stages of setting.

In 1-oz. screw-cap bottles.

ALBA ALLOY

Our well-known "white" Alloy. Not readily oxidizable. Follow directions in using.

In ½-oz. and 1-oz. screw-cap bottles, and 4-oz. metal flasks.

ARRINGTON'S NEW AMALGAM

An old-time stand-by—on the market more than a third of a century. Successfully used by thousands of dentists.

In ½-oz. and 1-oz. envelopes, and 4-oz. metal flasks.

SPLENDID ALLOY

More especially a contouring Alloy. Tough and hard. Works best with minimum of mercury.

In ½-oz. and 1-oz. metal boxes.

TOWNSEND'S AMALGAM

The oldest Alloy on the market—a record of good, saving work of nearly half a century behind it.

In ½-oz. and 1-oz. envelopes.

You can buy any of these Alloys at the prices quoted below

Price	.....	per oz.	\$1.50
" in 5-oz. lots	.....	"	1.40
" " 10 " "	.....	"	1.35
" " 25 " "	.....	"	1.25
" " 100 " "	.....	"	1.10

GLOBE ALLOY

A distinctively high-grade Alloy, containing tin, silver, gold, and platinum, and affording all the advantages which come from the admixture of the higher metals. Quality remarkably uniform. Wherever the characteristic qualities of a gold and platinum Alloy are desired, the Globe will be found to meet the requirements.

Filings or shavings.

In ½-oz. and 1-oz. envelopes, and 4-oz. metal flasks.

Price, Filings or Shavings	.....	per oz.	\$2.00
" " " "	.....	20-oz. lots	30.00

To the Dental Profession

CONTOUR ALLOY

Although I wrote in no indefinite manner regarding "Contour Alloy" in my notice of the appointment of The S. S. White Dental Manufacturing Company as sole agent for my make of plastic filling materials published in the December, 1901, Cosmos advertisements, p. 24, I yet think it due to that alloy, and to the work I have done for its development, that it should be specially placed before the dental profession as making an amalgam for usual work that is *by far* the best of its class.

Since I retired from professional work in 1896 I have devoted myself to that laboratory work in which I had been engaged as a lecturer and teacher for over twenty years, and with this experience I have worked mainly for the improvement of "Contour Alloy."

Having attained ample edge-strength, desirably prompt setting, ease of amalgamation, non-shrinkage and slight expansion, experiments were continued for increasing its already remarkable maintenance of color, which three years ago was *twice* greater than any other dental amalgam made.

These experiments have yet further increased this very important attribute until in the most recent severe testing with 60 grains of sulphuret of potassium to 1 oz. of water made as in comparison with 8 of the most extensively advertised alloys of this country and England, "Contour" maintained its color for *more than three times* the number of hours scored by any of its competitors.

It is from this showing that I place "Contour" as the only truly "first-class" amalgam alloy for usual work ever offered to dentistry, and as the nearest approach yet made to an "Ideal Filling Material."

(Signed)

J. FOSTER FLAGG.

PRICES

Contour Alloy	per oz. \$3.00	{	5-oz. lots	\$12.50
			10 " "	22.50
Submarine Alloy			5 " "	10.00
Facing Alloy	2.50	{	10 " "	18.00
Gutta-Percha Stopping			$\frac{1}{8}$ -oz. pkg.	1.00

THE S. S. WHITE DENTAL MFG. CO., Sole Agent

"THE OLD RELIABLE"

Lawrence's



Amalgam

With a single exception, Lawrence's is the oldest amalgam now on the market. That it has endured through forty years or more of widespread use is strong testimony to its character.

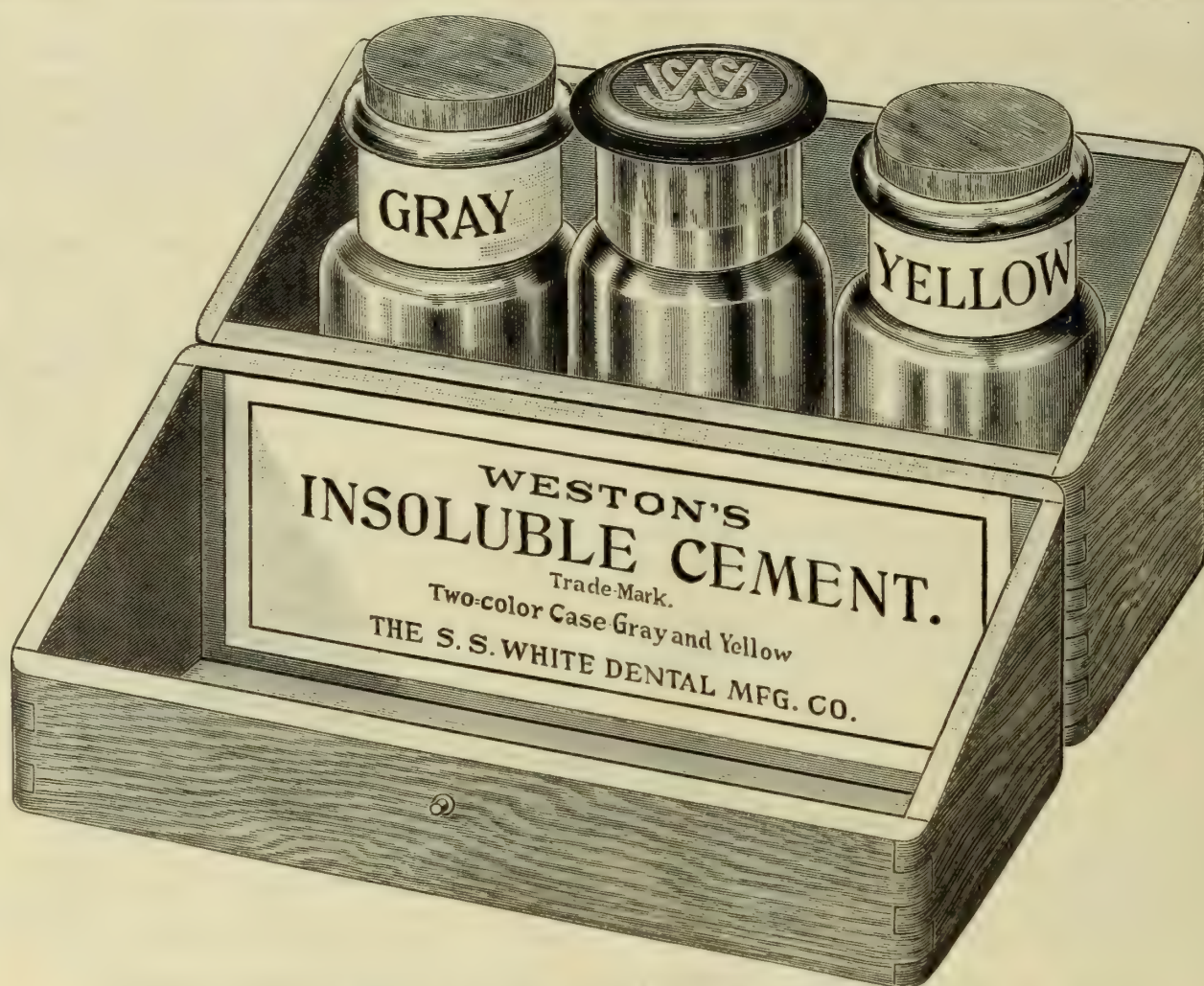
Lawrence's Amalgam is always put up in a white lithographed envelope covering a brown one containing the amalgam, with Trade-Mark on the lap of each, and both copyrighted. Put up in $\frac{1}{8}$ -oz., $\frac{1}{2}$ -oz., and 1-oz. envelopes.

PRICES

1 ounce....	\$3.00	2 ounces....	\$5.50	4 ounces....	\$10.00	10 ounces....	\$20.00
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THE S. S. WHITE DENTAL MFG. CO., Sole Agent

WESTON'S INSOLUBLE CEMENT



TWO-COLOR CASE. ACTUAL SIZE

Wherever dentists discuss the use of Cements for filling teeth you will find Weston's Insoluble spoken of favorably. Every man of the group has had experiences with it which make him know and appreciate its usefulness.

It is uniform in quality, mixes easily, sets promptly, hardens satisfactorily, and lasts indefinitely.

You can get it in three forms:

One-Color Case.—Regular Gray Color, suitable for general use.

Two-Color Case,—Gray and Yellow, the two most commonly used shades, in large quantity.

Four-Color Case,—White, Yellow, Blue, Brown,—a companion to the One- or Two-Color Case to give variety of shades to meet all needs.

PRICES

One-Color Case.....	each	\$0.50;	lot of 10 cases	\$4.50
Two- " "	"	.75;	" " 10 "	7.00
Four- " "	"	.75;	" " 10 "	7.00

WESTON'S XENOLITE

Weston's Xenolite is standing on its record now. It has been in service long enough to demonstrate its usefulness as a tooth-saver, which after all is what a Cement is used for.

- It is under as perfect control as amalgam or gutta-percha.
- It is not affected by climatic or atmospheric conditions.
- It works at any temperature and packs like gutta-percha, leaving a smooth and glossy surface.
- It burnishes and polishes with a finish resembling enamel.
- It resists the fluids of the mouth.
- It is hard and strong, and does not deteriorate with age.

In any of the three usual colors,—Gray, Ivory, Brown, in three sizes and forms of package.

The ½-oz. package contains a bottle of Gray, Ivory, or Brown Powder (as ordered), and the necessary liquid; the 1½-oz. Color package contains two bottles of Gray, one bottle of Ivory, one bottle of Brown, and two bottles of liquid; the Large Case contains two large screw-cap jars of powder, both one color, or any two (we supply Ivory and Gray unless otherwise ordered), and a screw-cap bottle of liquid sufficient to mix the whole.

PRICES

½-oz. pkg, Gray, Ivory, or Brown	\$1.00	Large Case	.....	\$1.50
Liquid or Powder only	.50	Liquid only	.....	per bottle .60
1½-oz. Color package	1.50	Powder “	.....	“ .50
Liquid or Powder only	.30			

HARVARD CEMENT

Harvard Cement is a superior filling material, adhering closely to the bottom and walls of the cavity, becoming very hard and being insoluble in the fluids of the mouth. The range of colors in which it is supplied makes it possible to match any tooth so that the filling shall be inconspicuous.

Harvard Cement sets in from ten to fifteen minutes, during which time it should remain under the rubber dam, unless the operator prefers to coat it with sandarac or paraffin.

In the judgment of many workers of porcelain inlays Harvard Cement leads all other substances in cementing these inlays into the cavities. It also is peculiarly fitted for fastening gold crowns, gold bands, and bridge work in place.

Harvard Cement comes in twelve different colors:

No. 1. White.	No. 5. Yellow.	No. 9. Gray.
“ 2. Bluish White.	“ 6. Gold Yellow.	“ 10. Green Gray.
“ 3. Yellowish White.	“ 7. Light Pearl Gray.	“ 11. Bluish Gray.
“ 4. Light Yellow.	“ 8. Pearl Gray.	“ 12. Brown.

Sold as single colors, in two sizes, containing, respectively, 1½ ounces and ½ ounce, and in assorted four-color packages, as noted below. The assorted packages contain ½ ounce of each of the colors, making 1½ ounces in all, with two bottles of liquid.

One bottle of each of 3, 4, 7, and 8.
“ “ “ “ “ 1, 5, 9, “ 12.
“ “ “ “ “ 2, 4, 8, “ 12.
“ “ “ “ “ 1, 2, 3, “ 7.
“ “ “ “ “ 2, 3, 4, “ 7.
“ “ “ “ “ 1, 3, 5, “ 8.

Every genuine package bears on the label a fac-simile of the signature of Rob. Richter, D.D.S., by whom every portion is thoroughly examined before being placed on sale.

PRICES

Single Colors, 1½ oz. Packages	.....	per package	\$2.25
“ “ Liquid or Powder for same, only	.....	“ bottle	1.13
“ “ ½-oz. Packages	.....	“ package	1.25
“ “ Liquid or Powder for same, only	.....	“ bottle	.63
Assorted Colors, 1½-oz. Packages	.....	“ package	2.50
“ “ Liquid for same, only	.....	“ bottle	.65
“ “ Powder for same, only	.....	“ “	.50

The S. S. White Dental Mfg. Co., Sole Agent for the United States

HOUGHTON'S OS ARTIFICIEL

Os Artificiel has been continuously before the profession since 1860, and we doubt not there are practitioners who have continued its use with satisfaction to themselves and their patients from the time of its early testing period to now.

It is slow-setting, retaining the putty-like quality for several minutes after mixing, greatly enlarging the operator's opportunities for its proper manipulation. Aside from this change it retains the characteristics which gave it its place among the recognized filling-materials. These qualities are: Extreme toughness, strength, flint-like hardness, and insolubility after hardening.

Put up in glass-stoppered bottles, containing nearly a half ounce.

Price, per package.....	\$0.75
" Liquid or Powder, separately.....per bottle	.38

AGATE CEMENT

The density or hardness of fillings made of Agate Cement has always been its distinguishing feature. It was this reliable, dependable hardness, perhaps more than any of its other excellent qualities, which kept Agate Cement in many offices during the period when oxyphosphates largely supplanted the oxychlorids with the majority of practitioners.

Putty-like in its working quality, easy to manipulate, and reliable in its results.

Put up in boxes containing one ounce and one-half ounce.

Price, $\frac{1}{2}$ -oz. Boxes	per box	\$0.75
" $\frac{1}{2}$ " "	10 boxes	6.00
" Liquid or Powder, separately.....	per bottle	.38
" 1-oz. Boxes	per box	1.00
" 1 " "	10 boxes	9.00
" Liquid or Powder, separately.....	per bottle	.50

DR. J. FOSTER FLAGG'S OXYCHLORID

PREPARED UNDER THE SUPERVISION OF DR. FLAGG

Price, per package.....	\$1.00
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The S. S. White Dental Mfg. Co., Sole Agent

THYMOZONE

Thymozone is a combination of eucalyptus glob., thymus vulg., pinus sylvestris, benzo-borate of sodium, and salicylic acid. The composition suggests its value in pyorrhea alveolaris, inflamed conditions of the oral mucous membrane, in pharyngitis, tonsillitis, antral catarrh, ozena, etc., and all cases needing prolonged antiseptic treatment.

Peculiarly adapted to the needs of the dentist as an antiseptic and deodorant, because it is fatal to bacteria, and will destroy the germs and organisms which collect around and between the teeth. It is a colorless liquid, neutral or slightly alkaline in reaction, stimulant, highly antiseptic, non-irritant, non-poisonous, and freely miscible in water in all proportions; has none of the objectionable qualities of carbolic acid, corrosive sublimate, etc., while it acts with equal promptness and certitude.

Used of full strength or diluted, as a wash or gargle, or as a spray from the atomizer.

Price	16-oz. bottle	\$0.75
"	8 " "	.50
" per dozen	8 " "	5.00

VAPOCAIN

An ethereal solution (15 per cent.) of cocain hydrochlorate for the purpose of increasing the penetrating power of the cocain. It is claimed that Vapocain affords the maximum of anesthesia with the minimum of cocain. The explanation of its action is that the heat of the mouth vaporizes a portion of the ether and drives the natural fluids of the tooth out of the tubuli, thus securing a rapid distribution of the remainder of the solution throughout the tooth-structure. As this portion of the ether is dissipated the cocain salt is deposited in minute subdivision throughout the tubuli. The cocain is then redissolved by the natural fluids of the tooth, assuring a rapid and effective anesthesia.

Used by saturating a pledget of absorbent cotton with Vapocain and applying to the sensitive dentin. Some operators prefer to cover the cotton with rubber to prevent too rapid evaporation of the ether.

Price	per bottle	\$0.50
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EIGHTEEN-BOTTLE MEDICINE CASE

This compact, well-made Case has room for eighteen of our half-ounce square medicine vials.

Made of oak, 7 x 3 $\frac{3}{4}$ x 3 inches outside measurements, with nickel-plated handle, cam-hook fastenings, and trimmings.

Price, empty	\$1.00
" filled	2.25

TRADE
FORMAGEN
MARK

Registered February 22, 1898. No. 31,299



Formagen is a cement, not for filling teeth, but to be used as a lining in sensitive cavities and over nearly exposed and inflamed pulps.

Its use is indicated:

- (a) Wherever caries approaches so near the tooth pulp as to leave but a doubtful amount of protective dentin.
- (b) When an accidental exposure of the pulp is made in excavating the carious dentin.
- (c) When through neglect a recent exposure is apparent, with or without acute pulpitis.
- (d) In multiple-rooted teeth where the finer canals are inaccessible.

In all these cases it offers a successful alternative to the destruction of the pulp.

The pain of inflamed pulps is quickly lulled by the application of Formagen, and a filling of cement or gutta-percha or amalgam can be put in over it without delay. Formagen is entitled to a test of its qualities, especially in cases where without it extirpation or the forceps are the alternatives. Applicable in all stages of pulpitis, but contraindicated in periostitis.

Formagen as sold comprises a powder and a liquid, put up in glass-stoppered bottles, with directions, inclosed in a wooden box. When mixed in accordance with the directions, it is somewhat sticky, adheres to the instrument. Dipping the instrument into the powder will cure that.

Two sizes of package, the larger double the size of the smaller.

SMALL PACKAGES		PRICES	LARGE PACKAGES	
Per box		\$1.50	Per box	\$2.50
Liquid or Powder, separately, per bottle	.75		Liquid or Powder, separately, per bottle	1.25

CAVITINE

A superior lining for cavities. It is quick-drying, an effective insulator and preventive of pulp-irritation arising from the conduction of heat by metallic fillings, or from the action of zinc plas-tics. Cavitine is colorless, and is not affected by the fluids of the mouth, by moisture, or by chemi-cal agents. A thin film of it upon the cavity wall aids in the preservation of the walls.

The properly prepared cavity should be perfectly dried with warm air, and carefully coated with Cavitine on a little wisp of cotton wound on a fine-pointed instrument. Follow with blasts of warm air, and fill at once.

Keep Cavitine closely stoppered, and avoid the vicinity of a flame while the bottle is open.

Price per bottle \$0.25

Dr. Wessels' Non-Conductive Cavity Lining

Dr. Wessels' Cavity Lining is non-conducting, non-irritating, impermeable to moisture, "sticky," and easily applied. It dries quickly, so that no delay is caused by its application. It has shown itself a reliable fender for the pulp through several years of widespread use, protecting it against thermal shock from metal fillings, or the possible devitalizing influence of some kinds of cement fillings in deep cavities. It penetrates the dentinal tubuli, and being a germicide, aids in preventing further decay.

Its principal uses are:

As a cavity lining.

As a covering for an exposed pulp.

As an aid in starting a gold filling.

Retaining pits and grooves which are often a menace to the life of the pulp can be dispensed with. The cavity simply needs to be made retentive in shape. The very sticky nature of the Cavity Lining insures the retention of the first piece or few pieces of gold, to the floor and walls of the cavity at the proper place and the filling is built upon this just as from a retaining pit or groove.

It has other minor uses,—for stopping a leak in rubber dam; for holding wedges in place; for pre-venting gutta-percha from drawing out of the cavity when finishing, or for keeping cement fillings dry until they have set hard.

Put up in ½-oz. ground-glass-stoppered bottles.

Price per bottle \$0.35

Liquid Doppa



Nobody doubts that the best results in the mixing of dental cements are attained when powder and liquid are combined in the exact proportions which satisfy both elements. All the powders differ in fineness, in mass, and in density, while the liquids vary in specific gravity, in viscosity, and in miscibility. It follows that there is a best way of mixing each cement, and that this best way is probably not the same for any two.

As an aid to exactness, we offer the "Doppa" illustrated herewith. It is a solid glass rod, with one end plain and the other formed into a discoidal knob. It is passed through a perforation in the cork which stoppers the bottle, the knob end being immersed in the liquid. The cork is of course adjustable upon the rod, according to the depth of liquid. When lifted out, the rod and knob carry some liquid of which a drop or two can be *shaken* onto the slab to the left of the powder previously placed; but by *tapping* the slab with the doppa, a dop, which is but a part of a drop, can be placed. Thus by successive dips, and shakes, or taps, the liquid for a bridge, cap, filling, or inlay mix can be neatly and quickly placed to produce a cement of creamy, pasty, or putty consistence. The idea throughout is that the quantity of fluid can be increased by minute increments, the unit of measurement being only a fraction of a drop.

Besides the exactness and thoroughness of mix which this method assures, it is economical,—no more fluid is taken from the bottle than is required.

The Doppa will be found especially valuable in making mixes for inlays, but the principle is just as readily carried out in filling or bridge mixes.

Two sizes of corks, adapted for our one-color and four-color cement liquid bottles. Other corks can be readily perforated for the purpose.

Price, with either cork.....	each	\$0.05
" " " "	per dozen	.50

Pure Charcoal Points

INVENTED BY DR. LOUIS ARNDT

PATENTED FEBRUARY 10, 1903

The use of charcoal in filling putrescent root-canals is based on the known value of carbonized wood as a deodorant and disinfectant. It absorbs the gases of putrefaction present and disinfects and deodorizes the disintegrated organic tissues remaining in the canals, rendering them inert. Then, the canal being thoroughly filled and the entrance to it sealed, there is no further trouble. That at least is the experience of those who have used charcoal in this way.

The inventor of these Charcoal Points has filled canals with charcoal for years. Now he has evolved a method of making Points by which they can be placed at the service of all men, affording Charcoal in available form for easy manipulation.

The Charcoal Points are made of the best wood for the purpose, and their carbonization is complete. They are small, fairly tough, to facilitate insertion in the root-canals. Within the narrow limits of root-canal calibers, they vary considerably, but are not made in exact sizes.

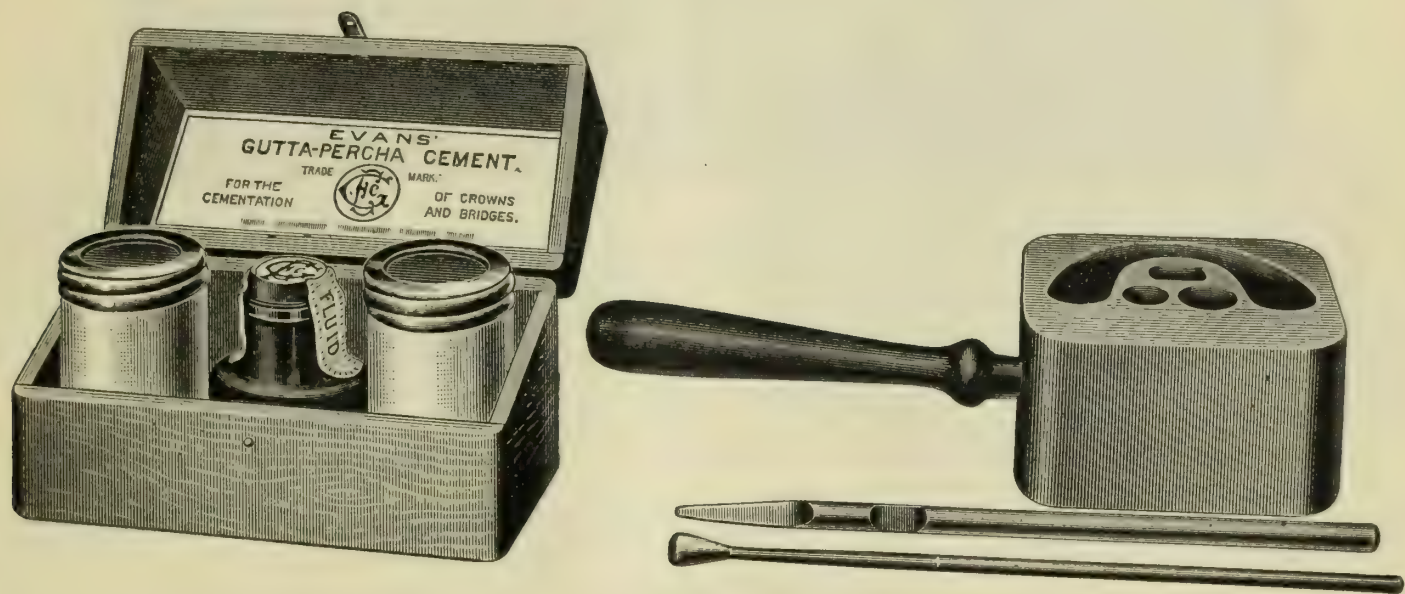
They are forced into the canal, and then crushed and packed so that the entire canal is filled with this lasting deodorant and disinfectant. The Points can be medicated, if desired, at the time they are inserted; the porous nature of the material enables it to take up the medicament to the saturation point quickly. This gives the operator the opportunity of using whatever drug seems desirable. Dr. Arndt prefers to use the Points without medication, as he claims that the remarkable absorbent capacity of the charcoal for the gases of putrefaction affords all the protection necessary.

Put up in boxes of 100.

Price.....	per box	\$0.30
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Evans' Gutta-Percha Cement and Outfit for Setting Crowns and Bridges

MANUFACTURED BY THE EVANS COMPANY



Dr. Evans's Gutta-Percha Cement is offered as the ideal preparation for setting crowns and bridges in 90 per cent. of the cases which present.

Its manipulation is as easy as that of an oxyphosphate.

It is extremely adhesive,—a crown or bridge set with it stays.

It is insoluble in the fluids of the mouth, there is no disintegration, and naturally no wear.

It acts as an elastic cushion, preventing damage from too severe use.

In case of need for removing the piece, the application of a hot instrument will loosen it.

There are two reasons for the satisfactory work done with this particular preparation of gutta-percha. The first is the perfect adaptation of the Cement to its purpose. The second is the manner in which it is worked, and that involves the outfit.

Without going into details, the crown or bridge, the Cement, and the instrument with which the Cement is manipulated are all brought to one heat.

A moment's examination of the outfit will show how practically it does this.

There are two kinds of the Cement, Pink for crowns and bridges, White for either porcelain or open-faced gold crowns. Besides a jar of each, the outfit contains a bottle of Adhesive Fluid and a brush for applying it; a Gutta-Percha Cement Heater, Gutta-Percha Cement Spatula, and a Gutta-Percha Crown Heater, all especially devised and adapted for working the Cement.

Price, Complete Outfit..... \$5.00

OR SEPARATELY

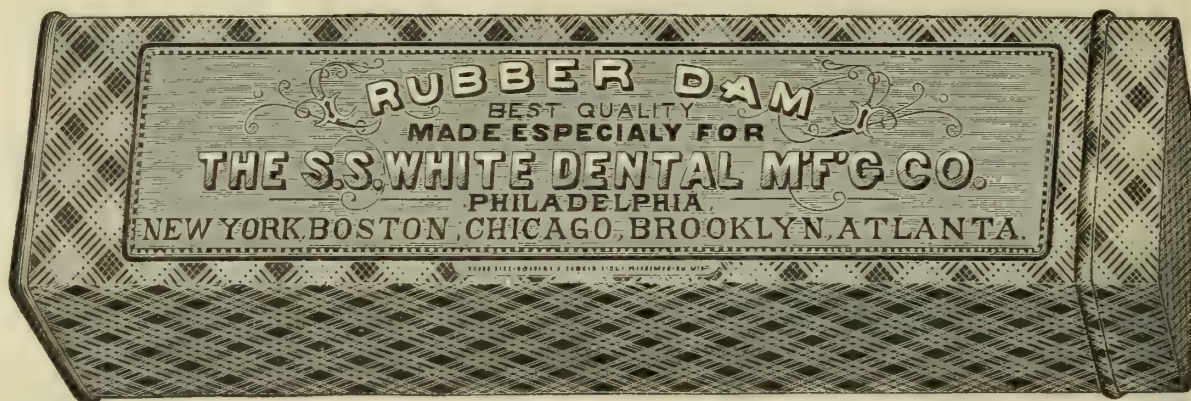
Case of Gutta-Percha Cement, containing one jar each of Pink and White Cement,	
Bottle of Adhesive Fluid and Brush.....	3.00
One Jar of Pink or White Cement.....	1.50
Bottle of Adhesive Fluid	.50
Gutta-Percha Cement Heater	1.50
“ “ Spatula	.65
“ “ Crown Heater	.85

Trial Package containing Cement and Adhesive Fluid 1.00

Full instructions accompany the Cement.

RUBBER DAM

Stands Stretching—Does Not Tear



Our Rubber Dam is sure to give satisfaction. It has the toughness and the elasticity which the dentist needs. It stretches over the tooth without cracking or tearing, then closes around it with a grip which prevents moisture from getting under it.

Made of the best and purest rubber exuded by the trees, it is so manipulated in the manufacturing processes as to preserve intact its superior natural excellences for the behoof of the dentist.

1260 square inches to the yard. We sell it in the sheet (35 inches wide); in rolls, two sizes, 5 and 7 inches wide. The rolls are put up in cartons, yard and half yard, and in enameled metal cans, yard and half yard.

A yard of the 5-inch roll is 21 feet long; of the 7-inch, 15 feet long; half yards half these lengths, always the full quantity of dam measured in square inches.

PRICES SHEET

Thin {	Half yard.....	\$0.50	Medium {	Half yard.....	\$0.75
	One ".....	1.00		One ".....	1.50

ROLLS—IN CARTONS

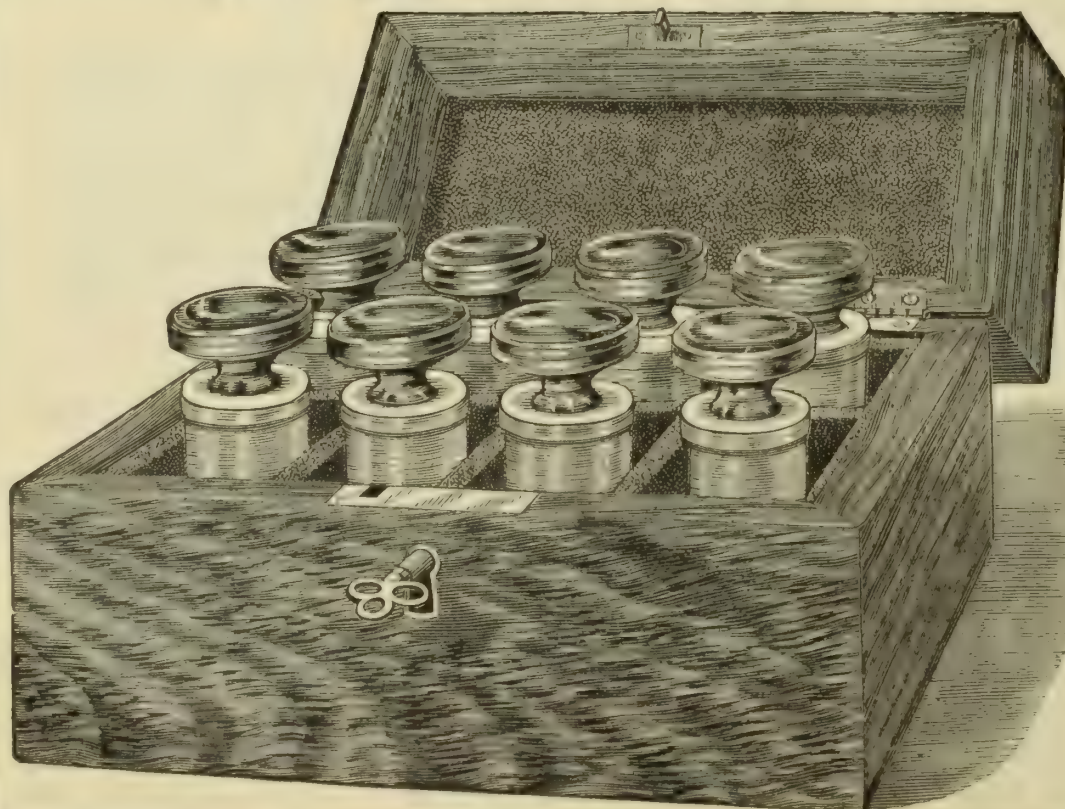
Thin {	Half yard.....	\$0.50	Medium {	Half yard.....	\$0.75
	One ".....	1.00		One ".....	1.50

ROLLS—IN ENAMELED METAL CANS

Thin {	Half yard.....	\$0.55	Medium {	Half yard.....	\$0.80
	One ".....	1.10		One ".....	1.60

We fill orders for Roll Rubber Dam with 7-in. Dam in enameled metal cans, unless otherwise directed

OFFICE PREPARATIONS CASE

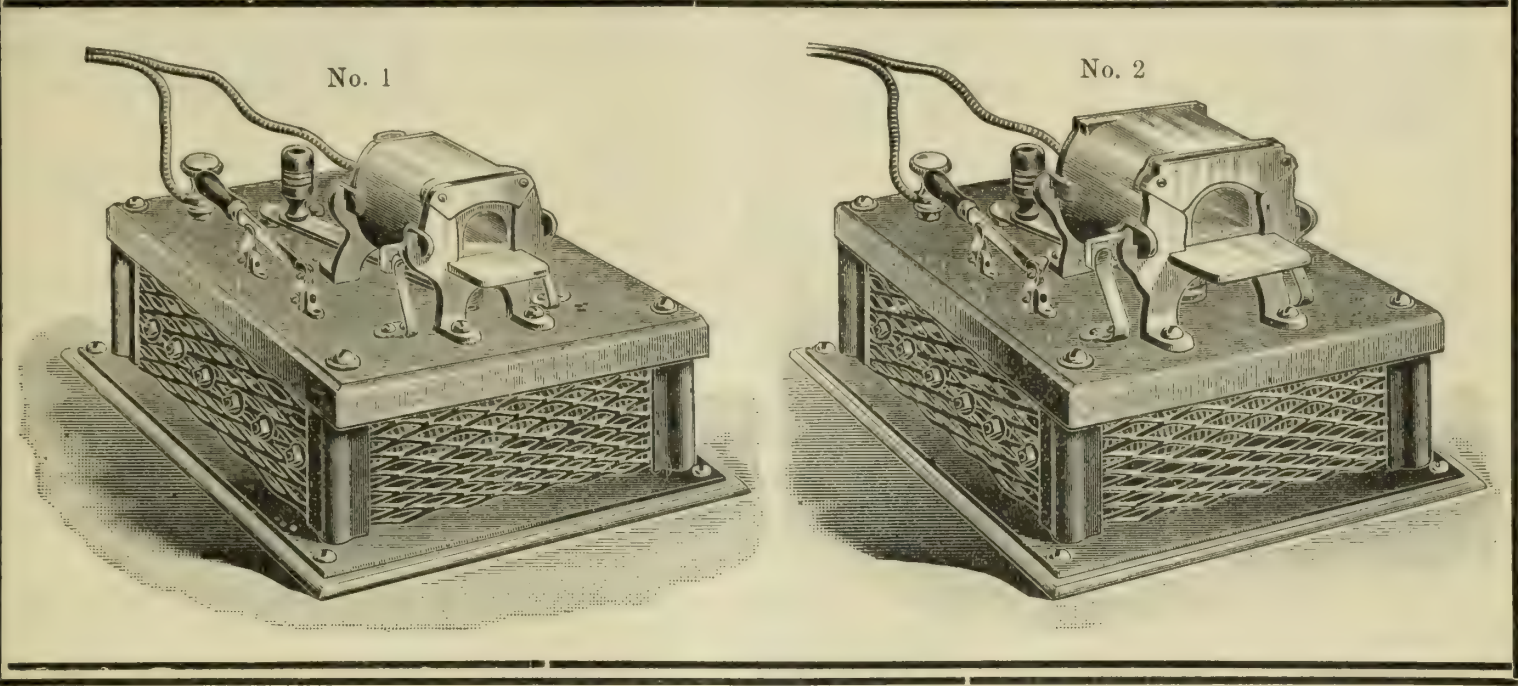


These Cases, made of walnut, handsomely finished, and provided with lock and key, have had an extensive sale. They contain eight half-ounce square vials, with flat-top glass stoppers. Outside measurements, 6 x 3½ x 3½ inches.

Price, including vials...\$2.50

The Hammond Electric Furnaces

Patented December 3, 1901, and February 10, 1903. In Great Britain, November 10, 1902. In Germany, November 11, 1902. In France, February 16, 1903. In Canada, May 12, 1903



In five years the porcelain inlay has advanced from a “fad” to a place in the regular curriculum of the dental college. It is fast coming to be a necessity to the dentist who claims to be fully equipped, and is rapidly growing into the practice of the progressive man everywhere. It is beautiful work; patients are learning its superiority, it is an easily acquired art, and it pays.

To practice inlay work you need a furnace which can be depended upon,—in a word, the Hammond. The No. 1 or No. 2 will meet every need. You can pay more money and buy the larger sizes, but if you are only intending to make inlays, it isn’t necessary,—No. 1 has all the capacity required,—plenty for crowns and even for bridges of one or two teeth. The No. 2 with the large muffle will bake bridges of ten teeth or less.

With a Hammond No. 1 or No. 2 you can work any body, high-fusing or low-fusing. You can use it on any current, direct or indirect, up to 220 volts. It is effective, works uniformly, makes a perfect fuse. It doesn’t get out of order readily, and you can repair “burn-outs” in a few minutes.

PRICES OF FURNACE No. 1

FOR 110 TO 120 VOLTS

Muffle is 1 inch wide, $\frac{1}{8}$ inch high, $1\frac{1}{4}$ inches deep.

Furnace complete	\$38.00
Muffle, wired and ready for use, separately.....	11.00

PRICES OF FURNACE No. 2

FOR 110 TO 120 VOLTS

No. 2 has three sizes of Muffle, which are interchangeable: Large, about 2 in. wide, $1\frac{1}{8}$ in. high, $2\frac{1}{4}$ in. deep; Medium, about $1\frac{1}{2}$ in. wide, 1 in. high, 2 in deep; Small, about 1 in. wide, $\frac{1}{8}$ in. high, $1\frac{1}{4}$ in. deep.

Furnace complete with Large Muffle	\$47.00
“ “ “ Medium “	45.00
“ “ “ Small “	41.00
Large Muffle, wired and ready for use, separately.....	18.00
Medium “ “ “ “ “ “	16.00
Small “ “ “ “ “ “	12.00

CATALOGUE FREE ILLUSTRATING AND DESCRIBING ALL FORMS

THE S. S. WHITE DENTAL MFG. CO., Sole Agent

LONG RIDGE-LAP TEETH

LABOR-SAVERS, TIME-SAVERS FOR THE BUSY DENTIST

It is probable that most of the grinding of porcelain teeth is upon the ridge-lap, that is, the rear line of the tooth from the shoulder just above the pin to the neck end in a plain tooth, and to the extreme edge of the gum in a gum tooth. This grinding is for the purpose of adapting the ridge-lap to the natural gum.

Years ago it became evident to us that with a properly shaped tooth much of this grinding could be saved, and therefore time. To this end we designed a line of long ridge-lap molds. This line comprises a considerable variety in sizes and shapes of the crowns.

The entire line of long ridge-lap plain teeth are shown in the illustrations following, some sixty odd molds. We have also a considerable line of the same class of teeth in gum sections and singles.

With this fine selection of sizes and forms, there is abundant opportunity for the selection of teeth closely adapted to almost any case which may present. We assert positively that if proper care is taken in the selection, the need for four-fifths of the grinding commonly found necessary will be obviated. All that ought to be necessary, as a rule, in the grinding of porcelain teeth, is the little touching up of the occluding surfaces for perfecting the occlusion, or in cases where it is desirable for "aging" the teeth.

In other words, minutes ought to measure the time devoted to grinding, which not infrequently occupies hours.

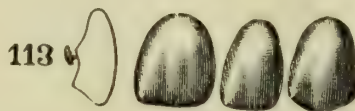
We commend this important point to the careful study of prosthetic dentists everywhere. The illustrations of the plain teeth will show why the grinding of these teeth necessarily will consume only a fraction of the time requisite in grinding out a proper ridge-lap from the heels of teeth not so perfectly adapted.

Our Catalogue of Porcelain Teeth, free for the asking, will be found an almost indispensable adjunct in the prosthetic laboratory.

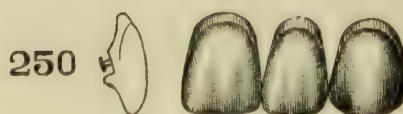
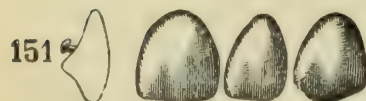
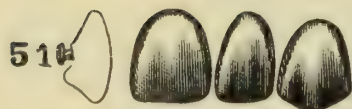
PLAIN TEETH FOR VULCANITE WORK

Upper, Incisors and Cuspid

SMALL SIZES.—Long Ridge-Lap, Short Bite



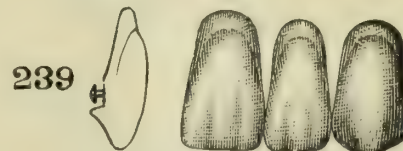
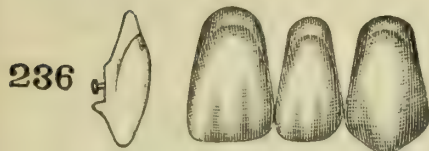
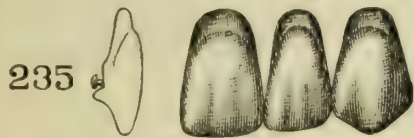
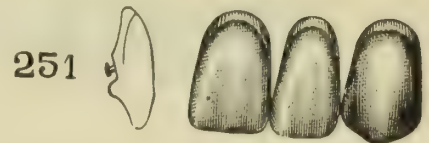
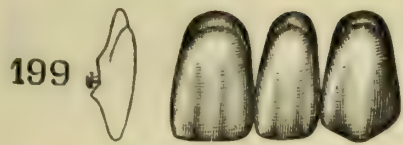
SMALL SIZES.—Long Ridge-Lap, Medium Bite



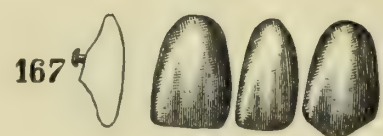
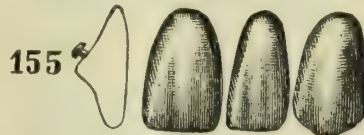
PLAIN TEETH FOR VULCANITE WORK

Upper, Incisors and Cuspid—(Continued)

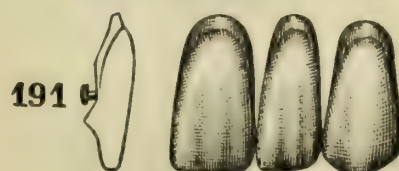
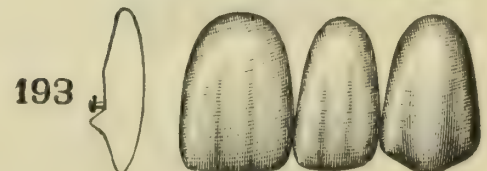
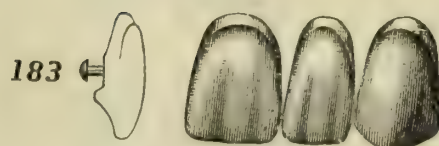
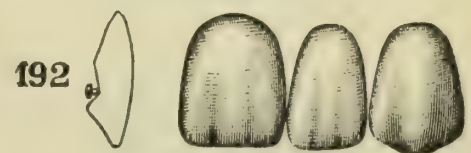
MEDIUM SIZES.—Long Ridge-Lap, Medium Bite (Continued)



MEDIUM SIZES.—Long Ridge-Lap, Long Bite



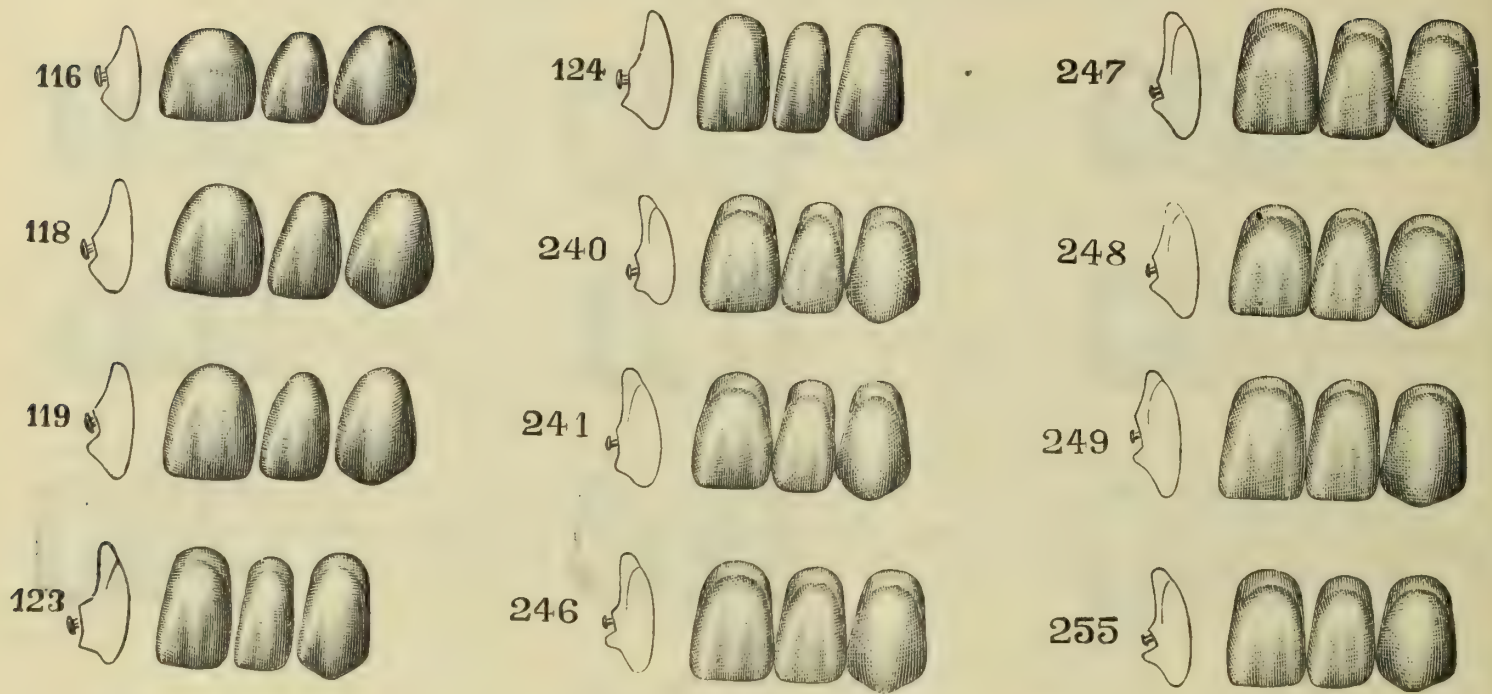
LARGE SIZES.—Long Ridge-Lap, Medium Bite



PLAIN TEETH FOR VULCANITE WORK

Upper, Incisors and Cuspid—(Continued)

MEDIUM SIZES.—Long Ridge-Lap, Short Bite



MEDIUM SIZES.—Long Ridge-Lap, Medium Bite



Making Seamless Gold Crowns

BY THE

DR. J. R. COMINS CROWN-BRIDGE SYSTEM

Patented April 28, 1903

Canada, August 18, 1903

England, March 19, 1903

SIMPLE, SURE

Of making gold crowns there is no end. You shall hear now of a method of making them, seamless, which to our mind is the simplest surest yet offered to the dental profession.

The strong point about this method or system is that you have the work under your eye during the entire process of the making of the crown. You can see whether the adaptation is perfect, and you have ready means for remedying any defect which may develop during the shaping.

YOUR EYES ARE YOUR SAFETY

You swage the crown *over* a form which you make of the exact size you want,—you see every change in the evolution of the crown from the shell. If “buckling” begins, you see it in its incipency, and tap it out before it becomes confirmed. You don’t have to wait till you think the crown is completed before you get a look at it, to find that you have to do it all over again. Instead you are looking right at it practically all the time,—all of it except the occasional brief placing in the Swage,—watching and guarding against any mischance.

THE TOOLS

The outfit as sold for this method consists of 160 Soft Rubber Molds, a rubber Casting Ring, an ingot of Fusible Metal, a small Ladle for melting it, and a Swage. In carrying forward the work you need besides, a package of Moldine, a good heavy hammer of say two or three pounds, and a small shaping hammer,—all found in any well-regulated dental laboratory.

“THE MOLD’S THE THING”

The Molds are the distinguishing feature of the system. They are cylindrical blocks of soft rubber, about three-quarters of an inch in length, and about the same in diameter. In each is a matrix for a tooth form, and the end of the Mold surrounding the opening—the neck of the tooth is recessed. The object of this recess is two-fold. It facilitates pouring the metal, and what is of greater moment, it makes a button on the end of the model for convenient handling.

As before said, there are 160 of these Molds, half for the right side, half for the left,—104 bicuspsids and molars, 56 incisors and cuspids,—uppers and lowers. There is ample range of size and form to meet any need. Besides, a model made in any of these Molds is easily changed in shape or reduced in size, if desired.

A chart of the various Molds is supplied, each diagram accompanied by a line measurement at the gum margin, and another somewhat beyond the margin, for use in recession of the gum.

THE OTHER APPLIANCES

The Swage is of cast iron, cylindrical in shape, about 2½ inches in diameter. Its plunger is of steel with a hemispherical depression in the working end. In use the cavity of the Swage and the depression in the plunger are filled with Moldine.

The Fusible Metal melts at a temperature below that of boiling water. The Ladle for melting it is of copper, with pouring lip, and ring on end of handle for hanging up.

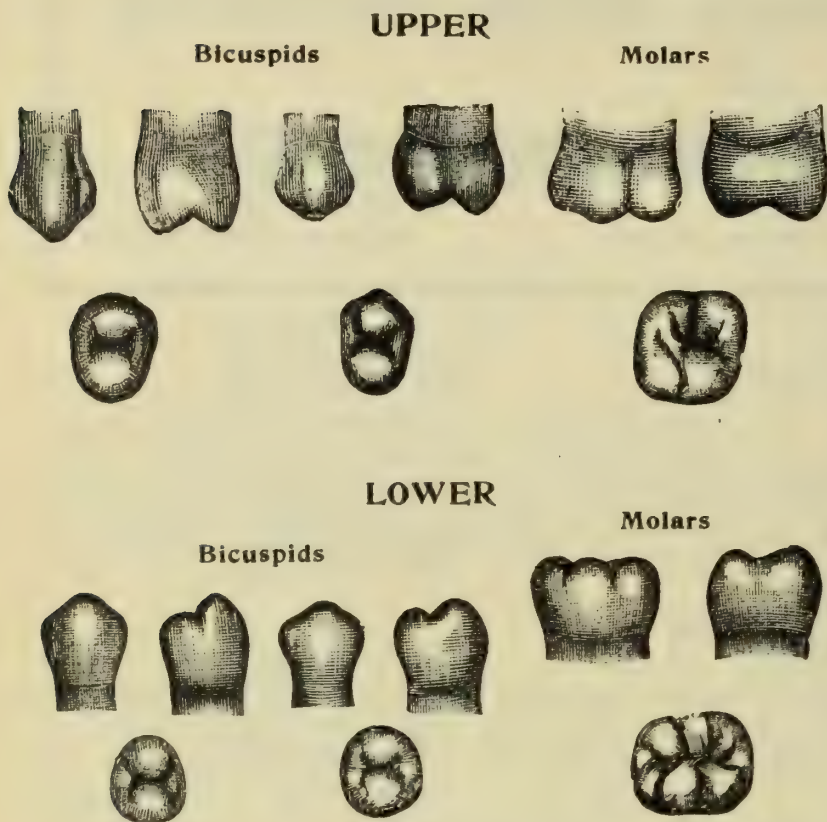
There’s an intensely practical air about the Comins System and the appliances for working it which will appeal to every practical dentist. It’s a system for results, and the tools are provided for bringing about those results. It’s easy to work, and quick.

Price, Outfit as described..... \$25.00

THE S. S. WHITE DENTAL MFG. CO., Sole Agent

THE EVANS GOLD SEAMLESS CONTOUR CROWN

Patented November 15, 1887



In these ready-made Gold Crowns, the points aimed to be accomplished are practical forms and perfect adaptability. The set, which comprises two hundred and fifty-one forms, affords a sufficient variety of sizes and shapes of crowns and necks to meet practically any usual case presenting, while the adaptability, which is a special feature of these crowns, will allow of such alterations as may be required in cases which deviate from the ordinary. As an example of the extent of the variations provided for, one of the upper bicuspid is made in nine sizes of crown, each of which again is made in three sizes of neck form.

Made of fine gold, seamless, so that each presents a uniform surface, which will not tarnish; they are easily and quickly adjusted, requiring only ordinary skill; they are readily altered to suit particular cases.

Pamphlet showing the exact sizes, with directions, sent on application.

PRICES

Gold Bicuspid Crowns, all sizes.....	each	\$2.00
“ Molar “ “ “	“	2.50

CROWN STICKY=WAX

CROWN STICKY-WAX

MANUFACTURED BY

THE S.S. WHITE DENTAL MFG.CO.

PHILADELPHIA,

NEW YORK, BOSTON, CHICAGO, BROOKLYN, ATLANTA, ROCHESTER,
BERLIN, BUENOS AIRES, ST. PETERSBURG, TORONTO.



Size and form of sticks

Crown Sticky-Wax, made more especially for the use of crown and bridge workers, is one of the best holders for teeth set up for soldering operations. It is much like a cement in many of its characteristics; clings tenaciously to surfaces to which it is attached. It has plenty of strength, breaks with a sharp fracture, and leaves the plate and backing clean when removed.

Made in round sticks as shown in the illustration. Each stick is wrapped in foil, and by removing this only as fast as the Wax is used, there will be no inconvenience in handling it.

Put up in boxes containing eighteen sticks.

Price	per box	\$0.50
-------------	---------	--------

Yellow Wax for Impressions

YELLOW WAX
FOR TAKING IMPRESSIONS.



The S.S. White Dental Manufacturing Co.

PHILADELPHIA

NEW YORK. ROCHESTER.
BOSTON. BERLIN.
CHICAGO. BUENOS AIRES.
BROOKLYN. ST. PETERSBURG.
ATLANTA. TORONTO.

MADE IN U.S.A.

Our Yellow Wax for taking impressions has all the characteristics of pure beeswax, for that is what it is. Wax is the oldest of impression materials, and it holds its place because of the ease with which it is manipulated. Besides the ease with which it is manipulated, our Yellow Wax has the advantage of being inelastic, and it contracts very slightly in cooling.

Put up in half-pound boxes.

Price per box \$0.38

FAC-SIMILE OF LABEL

Waxes for Base-Plates

YELLOW WAX

IN THIN SHEETS

FOR BASE PLATES

HALF POUND



The S.S. White

Dental Mfg Co.

NEW YORK.

ROCHESTER.

BOSTON.

BERLIN.

CHICAGO.

BUENOS AIRES.

BROOKLYN.

ST. PETERSBURG.

ATLANTA.

MADE IN U.S.A.

TORONTO.

PHILADELPHIA

FAC-SIMILE OF LABEL

Our Yellow Wax for Base-Plates is pure beeswax. Made in sheets, 5 $\frac{3}{4}$ x 3 inches, and put up in half-pound boxes.

Price per box \$0.50

SURFACE-COHESION FORMS FOR ARTIFICIAL DENTURES

Invention of DR. JOSEPH SPYER

FIG. 1

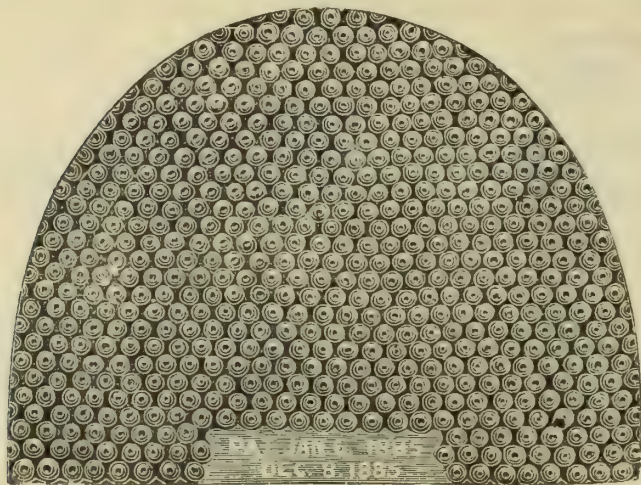
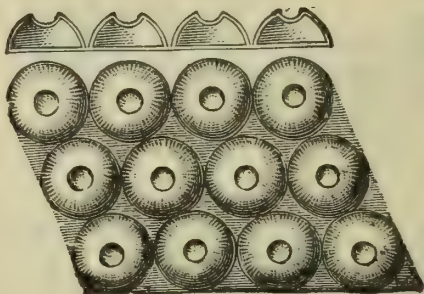


FIG. 2

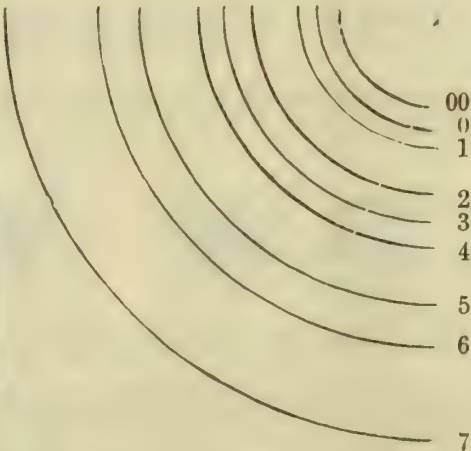
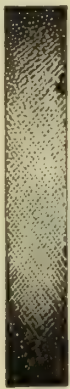


A thin metallic form, the surface of which is covered with minute papilliform prominences—shown in Fig. 2 magnified four diameters—which by displacement of mucus at the points of gum contact effect surface adhesion as if the denture were glued to the gums, yet cause no irritation and leave no marked indentations. Adapted for either upper or lower plates. By the aid of this device strong adhesion can be had with a narrow plate, and thus the sense of taste be left unimpaired. Lower plates so made are very firm. Put up in packages containing one dozen Forms size of Fig. 1, which can be cut for either upper or lower plates. Full directions accompany each package.

Price per box containing one dozen Forms \$0.25
Rubber Cement.....per bottle .25

“GEM” WHEELS FOR LATHE

The “Gem” Wheels for lathe-work have the constitutional qualities of the “Gem” class, great abrasive power, whether run wet or dry,—and durability. There are no soft spots in them; they are homogeneously hard throughout, and cut aggressively in every portion. They are all square edge, and $\frac{1}{4}$ inch in thickness or slightly less.



PRICES			Thickness
No.	Diameter		$\frac{1}{4}$ inch and less
00	$\frac{3}{4}$ inch	} each	\$0.10
0	$\frac{7}{8}$ "		
1	1 "		
2	$1\frac{1}{8}$ "	} . . . "	.20
3	$1\frac{3}{8}$ "		
4	$1\frac{1}{2}$ "		
5	$2\frac{1}{8}$ "	} . . . "	.40
6	$2\frac{1}{2}$ "		
7	$3\frac{1}{8}$ "		
			.50
Grits, fine and extra fine.			

SANDARAC VARNISH

Sandarac Varnish is the best-known parting fluid. In fact, it forms the basis for a number of preparations for the purpose. It forms the thinnest kind of a film, which is, nevertheless, a perfect barrier to the attachment of impression and model. Its color when applied is a light straw. To deepen this it is quite common to use first a Shellac Varnish, and then a coating of Sandarac. Our Sandarac Varnish is of the very best quality and quite heavy; can be diluted with alcohol.

Price 2-oz. bottle \$0.25

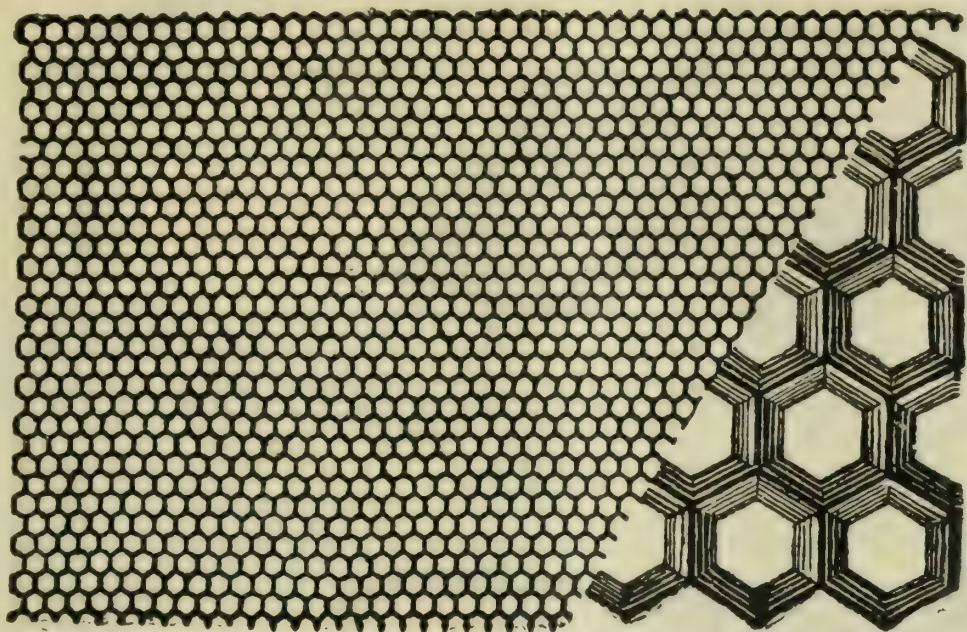
LIQUID SILEX

Liquid Sillex is used, just as the housewife greases the baking-pan, to keep vulcanite plates from sticking to the plaster of the model. It is in this respect a parting fluid. Here no color line is necessary, as the plaster and rubber differ so in color. It will keep for a reasonable time, but there comes a time when it deteriorates, after which it is unfit for use. When it is used properly the plate comes away from the plaster clean and with a finished surface.

Price 2-oz. bottle, with brush \$0.20

COMBINATION DENTURES

Invented by Dr. R. Wünsche, Annaburg, Germany



The Combination Denture is a combination of vulcanite and a reinforcing plate whereby the weight of the rubber is reduced and the plate made thinner and stronger.

The full size of the plate is about 2½ x 3½ inches as shown. The enlarged portion shows the countersunk character of the perforation, by means of which the rubber is clinched on the face so that it is impossible to detach it by any ordinary force.

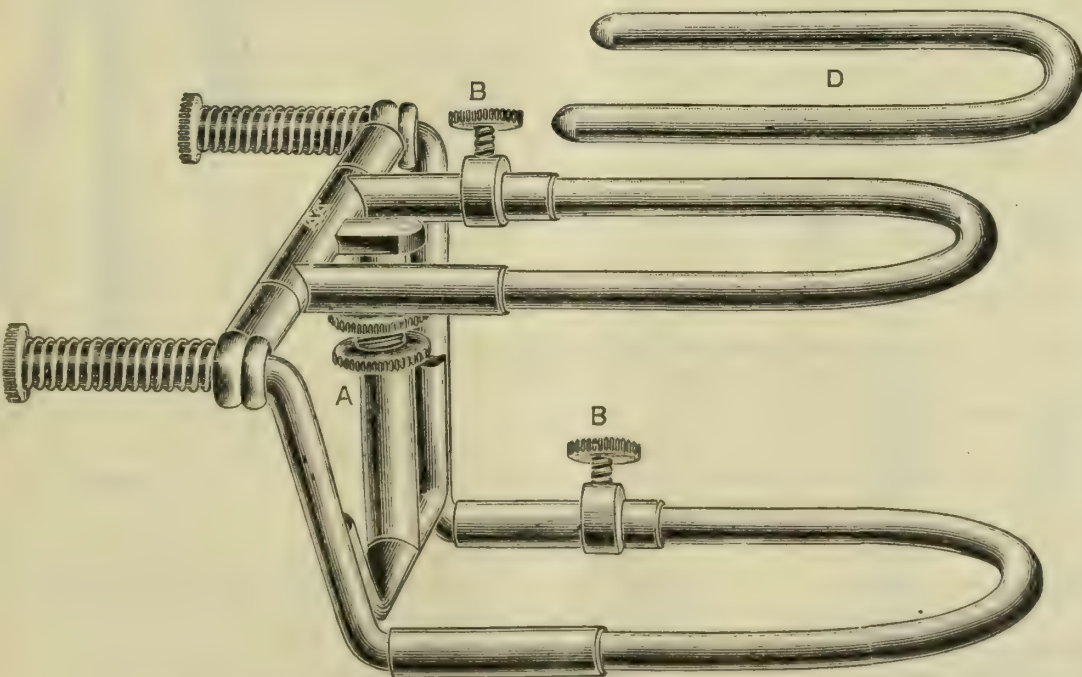
No trouble to fit the

cast—the metal plate is readily adapted to it. Made of a gold-colored alloy called Victoria Metal.

Put up in boxes of six, each containing full directions for use.

Price, No. 2 Victoria Metal Plates.....	each	\$0.35
“ “ 2 “ “ “	per box of six	2.00

Anatomical Articulator No. 7



The “Anatomical” Articulator is so called because it affords the opportunity to closely reproduce in detail the movements of the human jaw in mastication.

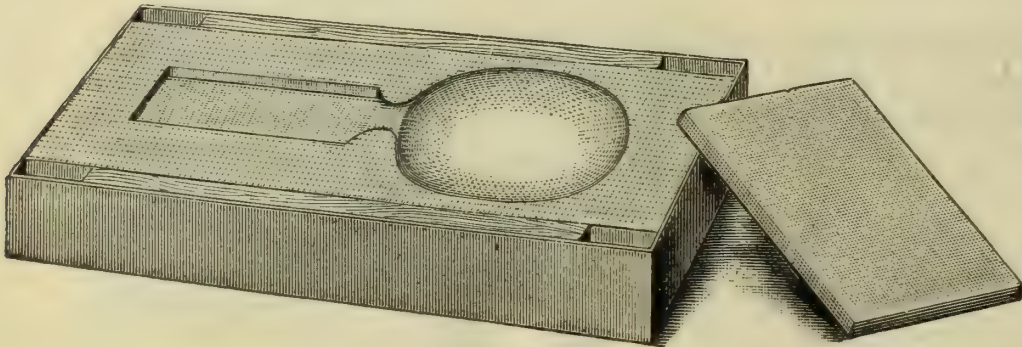
The Articulator (our No. 7) here shown is a modification of the original pattern of Dr. Bonwill’s. A standard and stop for fixing or for raising or lowering the bite by means of the milled nuts A is provided.

One very decided advantage of this form is that it has four pairs of interchangeable bows. An articulation or bite made with one pair can be detached, and another pair substituted for the taking of the next. A single No. 7 Articulator thus serves for four.

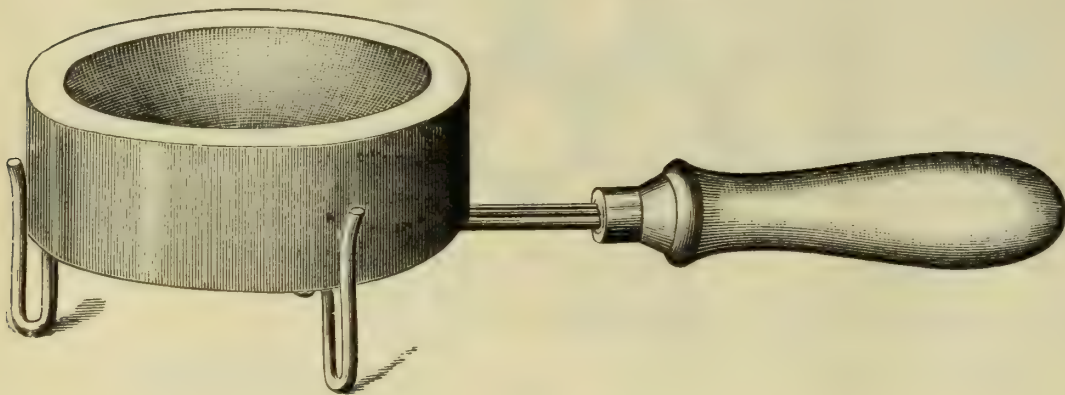
Price, complete, with 4 Upper and 4 Lower Bows.....	\$2.00
---	--------

Asbestos Soldering Blocks

Lee's Improved Brazing Blow-Pipe



No. 1



No. 2

No. 1. Asbestos Soldering, Melting, and Ingot Block, 6 inches long, 2½ inches wide, ½ inch thick. Put up in a tin box with directions for use.

Price..... \$0.50

No. 2. Asbestos Soldering Block, 4½ inches diameter, 1½ inches high. Concave top, with or without holder.

Price, No. 2, with Holder..... \$0.85

“ “ 2, without Holder..... .60

“ Holder separately 25

ABRADA

Abrada grinds away the inequalities in vulcanite plates, and polishes them; it does the same for metal plates. No waste, because the stick form gives absolute control of the quantity used.

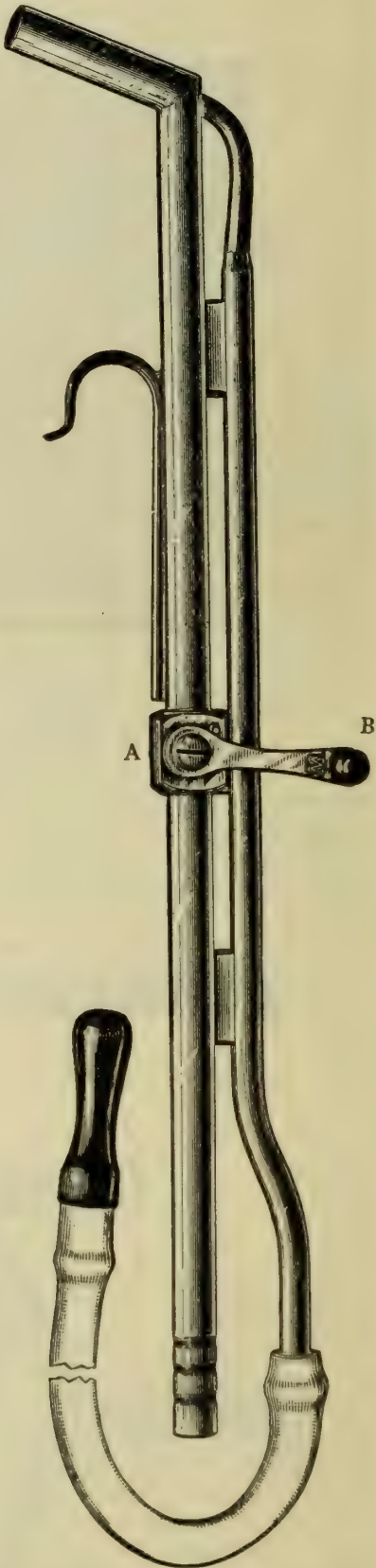
There are four of the Abrada preparations, each having a specific purpose. Don't mix their duties and you will be pleased with their work.

- No. 1, Fine, for Polishing Vulcanite
- No. 2, Medium, for Grinding Vulcanite
- No. 3, Fine, for Polishing Metals
- No. 4, Medium, for Grinding Metals

Put up in oval sticks, 4 x 1¼ x ¾ inches, each stick in a separate box, neatly labeled. Sold separately or in boxes containing sets of the four.

PRICES

Nos. 1 and 2.....	each	\$0.15
“ 3 “ 4.....	“	.25
In box of four.....		.70



This Blow-Pipe has won favor by the great volume of its brush-flame for heating up work, by the fine point of its wire-flame for flowing solder, and by keeping alight.

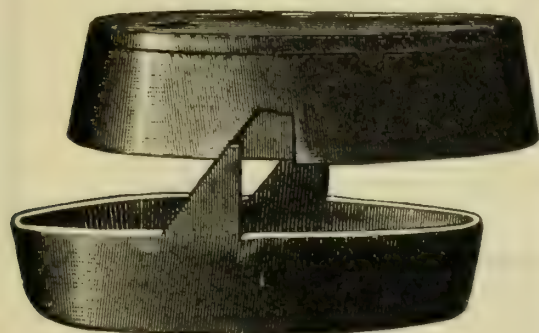
The screw A frictionally adjusts the lever B to permit its free movement under the thumb or finger and yet holds it still whenever the lever is let be; thus the full, partial, or fine flame can be continuously directed on the work; or the lever may instantly be moved to vary the flame at will. By this means the soldering process is simply perfected.

Price..... \$3.50

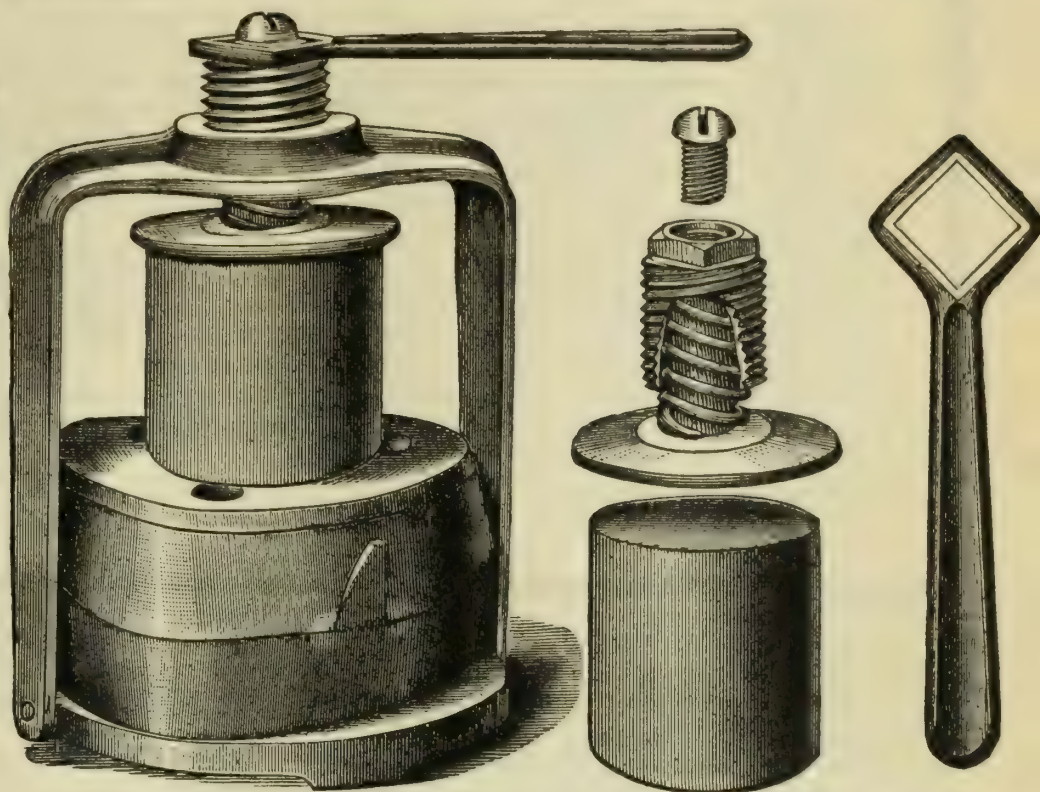
Closing the Flask by Spring Pressure

The two apparatuses for closing the flask in vulcanizing shown below dispense with the use of bolts in the flask. Instead a continuous spring pressure is applied, which operates automatically, so that when the rubber melts, at about 250° Fahr., the flask closes evenly, and is held under pressure constantly during vulcanizing, and while cooling. This method eliminates the danger from forcible pressure applied while the rubber is hard, avoids liability to spread the teeth or crack the teeth or investment, and assures a plate of even thickness.

The Seabury Dental Flask and Rubber Compress



FLASK, PARTLY OPEN



COMPRESS AND FLASK, SHOWING PARTS AND METHOD OF USE

The Flask is made of brass, in three parts, with vent-holes in the top. The guides, one on either side, work on an incline. Lugs indicate the proper placing of the top plate.

The Compress consists of a substantial yoke frame pivoted to a base for the reception of the flask, with a screw passing through the yoke. Within the screw is a spiral spring, through which the pressure is made by tightening the screw, which is worked with a lever wrench. When more than one flask is to be vulcanized at a time, they are placed one over the other, the screw is tightened, and the apparatus is placed in the vulcanizer.

The Compress is made in two sizes, for two and three flasks. When one case is to be vulcanized in a two-case compress, a metal block (supplied with the Compress) is set on the flask as shown.

Price, Brass Flasks.....	each \$1.25
“ Two or Three-Case Compress, including Lever and Block.....	2.00

Dr. Donham's Flask and Spring-Clamp

The Flask is of the three-part variety, with guides between on each side, and vent-holes in the top plate.

Made of brass.

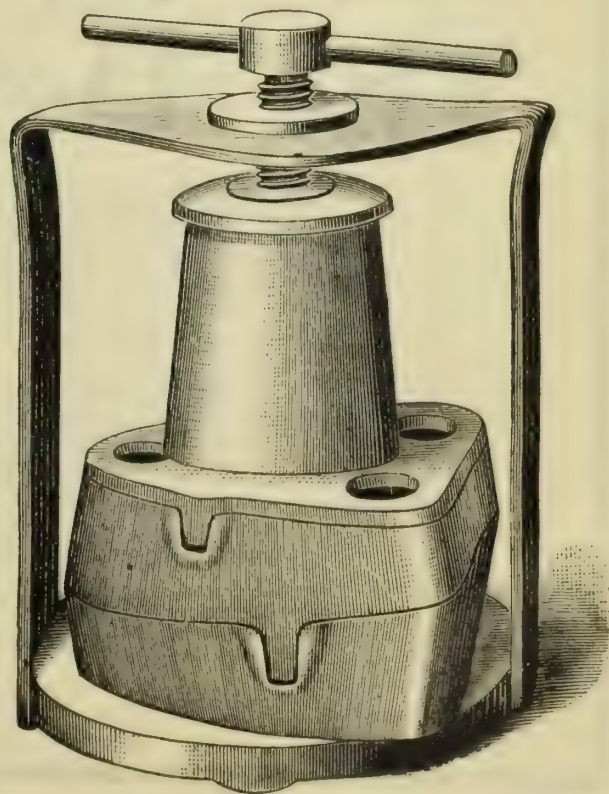
The Clamp is a yoke-shaped spring pivoted to the base on which the flask is set. A screw passing through the top of the yoke brings the tension of the spring to bear when tightened.

The screw is worked by a lever handle inserted through its head. It is a very simple, effective device.

Made in three sizes, for one flask, two flasks, or three flasks. The two-flask size can be used with a single flask, by substituting for the second one the metal block supplied with the Clamp.

PRICES

Brass Flasks	each \$1.00
Spring-Clamps for 1, 2, or 3 Flasks... “	1.25
Two-Case Clamp with one Brass Flask and Block, as shown	2.25
Two-Case Clamp with two Brass Flasks and Block	3.25
Three-Case Clamp, with three Brass Flasks	4.25



CALCAR

A SUBSTITUTE FOR MOLDING SAND

Suggested by DR. A. D. GRITMAN

This compound is free from some of the objections to the various forms of Molding Sand. It does not require the care to keep it in good condition; is free from odor, both in the can and when having metal poured into it; does not become "lumpy" from use; does not dry out and require retempering when exposed to the atmosphere.

As a matter of fact, while it will lose a portion of its water when used continually—the frequent contact with the molten metal is bound to cause evaporation—all that is necessary is to leave it exposed to the air for a few hours, and its working quality is restored, because it is hygroscopic.

Calcar is clean, sightly, and may be said to be always ready for use. It copies models exactly and smoothly in every detail. Models and dies may be cast in it with zinc, babbitt-metal, or any of the fusible alloys. Any style of flask may be used.

Calcar as sold has just moisture enough to work well. With little care it keeps in good condition for years. A tin can is a good receptacle to store it in. Whenever it begins to show a little dryness, a short exposure to the air will enable it to absorb sufficient moisture to restore its condition.

Put up in 2-qt. cans.

Price per can \$0.30

For Sale. In the Orient, a very high class \$10,000 practice, established 50 years. Complete equipment, electricity, furniture, etc., including a large stock of teeth and other supplies. Money required. Address, with references, "RAJAH," care of St. Louis Dental Mfg. Co., 209 N. Twelfth street, St. Louis, Mo.

For Sale. \$5000 practice in large Illinois city. Will remain six months with purchaser as partner. This will insure a profitable purchase. Address SMITH, Chicago Dental Mfg. Co., Chicago.



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OWING to discontinuance of reserve files, we have a limited number of complete volumes from 1880 to 1902 inclusive, which while they last will be supplied as follows:

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These rates apply only to Complete Volumes.
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"Mere man" does not appreciate THE DELINEATOR, but a million women think it is the greatest magazine on earth. It appeals to them with its Fashions and its careful illustrations of Style. It tells them about Cookery, about House-keeping, about the Hats they ought to wear, it offers them the Storiettes they like to read and advises on the thousand and one other details of women's daily life and interests.

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The Turner Alcohol Blow Pipe

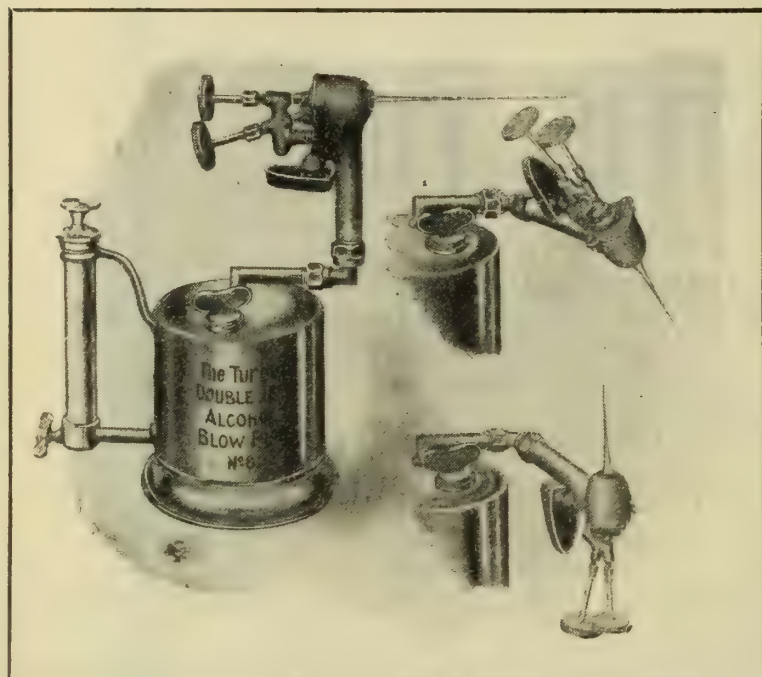
BURNS WOOD ALCOHOL

Burner may be turned in any direction

PRODUCES HEAT OF OVER 3000° F.

Write for New Catalog Just Out

DENTAL DEPOTS ACT AS SALES AGENTS



The Turner Brass Works 31 N. Franklin Street
CHICAGO

JUST LET GO

and the Cable and Hand-Piece of the **Columbia Electric Engine**

Swing Out of the Way

The motor is hung far enough in front of the chair to be out of the road, and the cable, when not in use, hangs perpendicularly from it.

To use it, pick up the hand-piece and go to work. To put it away, simply let go.

Could anything be more convenient?

Send for our beautifully illustrated catalogue which describes these engines in detail.

The Ritter Dental Manufacturing Co.
Rochester, N. Y., U. S. A.

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PORCELAIN

You can do better
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any other

The Brewster reputation
has been made with High
Fusing, but it is now made
in Low Fusing too. You
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you like. It keeps its form
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yourself how much better it
is than whatever low fusing
you are using.

It fuses at the melting-
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All the first-class dealers
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Immediate Mastication

will not disturb a filling of

**STANDARD
ALLOY**

and you may build the biggest
crown or pivot a tooth

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Three Dollars a half-ounce
Discount for Quantity

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PROPHYLACTIC
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LISTERINE

A true prophylactic

Listerine exercises an inhibitory action upon the acid-forming bacteria of the mouth, and thus maintains the alkaline condition so necessary for the welfare of the teeth.

- "**THE DENTIST'S PATIENT.**" An interesting little brochure on the care of the teeth, will be forwarded upon request, together with a new pamphlet of 32 quarto pages embodying:
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- "**EXPERIMENTAL RESEARCHES.**" A report by members of the Association of Analytical Chemists of the Pasteur Institute, Paris, concerning the antiseptic action of Listerine.

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All That Makes

The extract of **SUPRARENAL CAPSULES** valuable as a powerful astringent; a powerful hemostatic; a powerful heart tonic, makes

Sup-Re-Nol

The Ideal Local Anesthetic

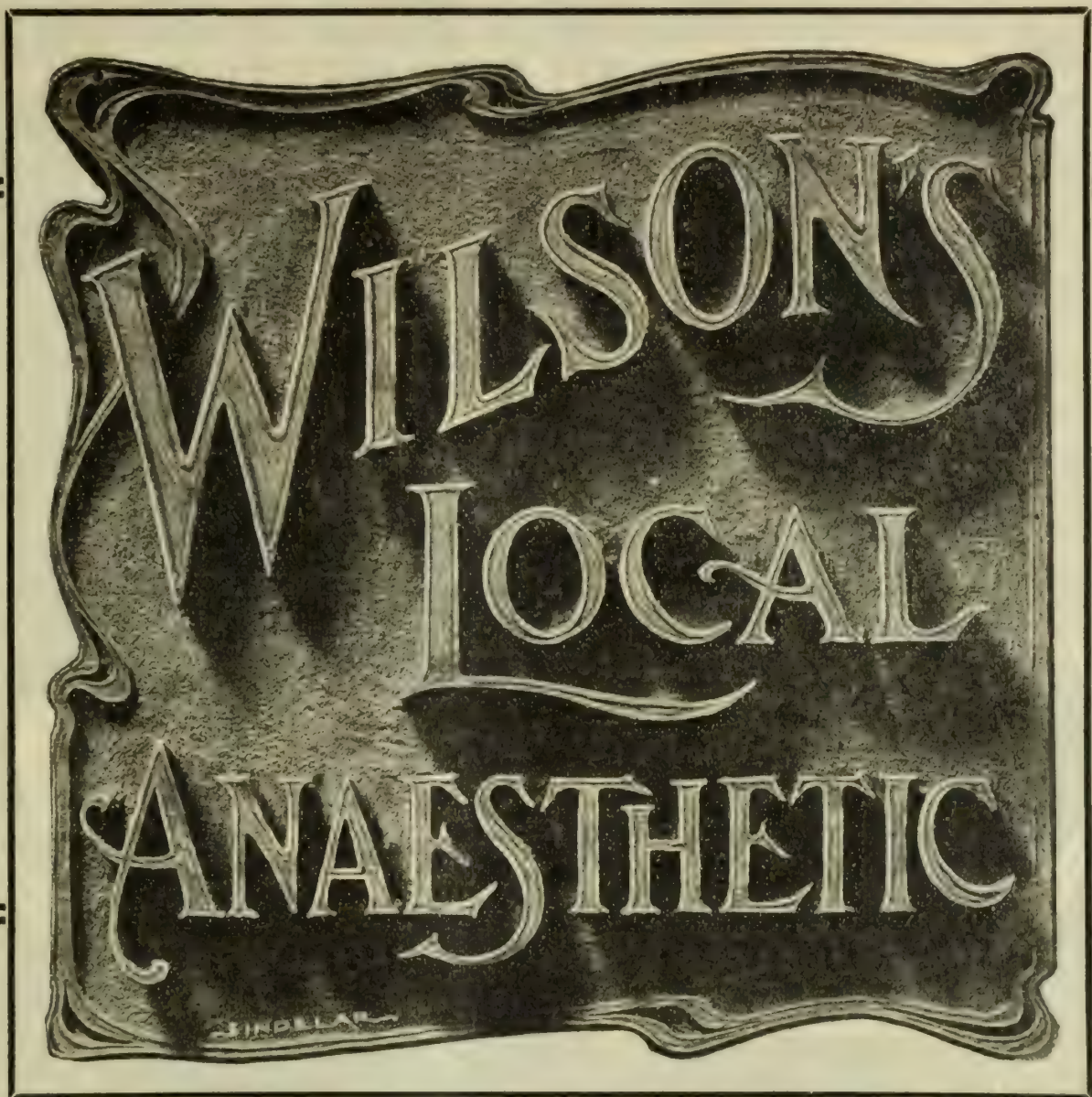
just that much better than any other local anesthetic on the market. Sup-re-nol does the work like no other anesthetic can. It is better. It is always dependable. Are you using it?
Order from your dealer.

Price:—1 oz., 75 cents; 5 ozs., \$3.00; 10 ozs., \$5.00
A syringe free with a \$5.00 order

FOR SALE BY THE S. S. WHITE DENTAL MFG. CO.

Manufactured by
Ideal Chemical Co.
ST. PAUL, MINN.

M. F. PATTERSON
DENTAL SUPPLY CO.
Wholesale Agents



You don't buy cheap teeth; neither do you buy cheap instruments. Can you afford to buy cheap Anaesthetics?

Wilson's

means all that is good in Anaesthetics, and our guarantee means that you can, at any time, if unsatisfactory, return **Wilson's** to the place of purchase and get your money. It is worth the price.

1 oz. 75c.; 2 ozs. \$1.50; 6 ozs. \$4.00; 12 ozs. \$7.50

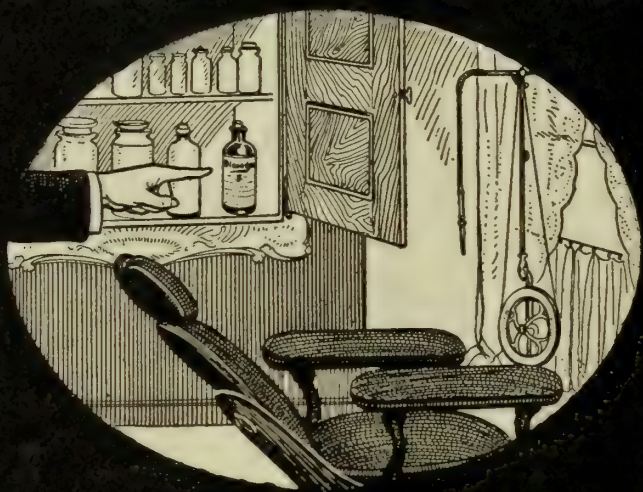
Manufactured by the **CENTRAL CHEMICAL CO.**

Wellsville, N. Y., U. S. A.

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For Sale by all DENTAL DEPOTS

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Dioxogen

$H_2 O_2 3\%$

**ANTISEPTIC
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**DISINFECTANT
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A necessity in operative and surgical work.
Destroys pus and the products of
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Cleans out cavities and destroys bad
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A positive tonic for weakened tissues
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Excellent for preparing sensitive
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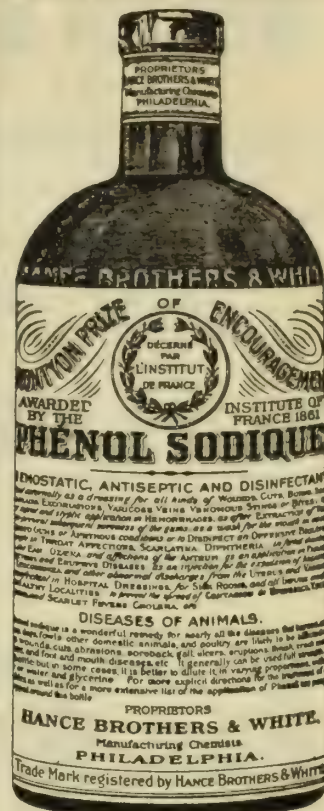
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Know by personal experience the value of Phénol Sodique in the treatment of nearly all oral diseases

Phénol Sodique has proved itself invaluable in numberless cases of

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PAIN AFTER EXTRACTION
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WELCH'S ALLOY, 1 oz., \$3.00; 2 ozs., \$5.50; 4 ozs., \$10.00; 10 ozs., \$22.50
WELCH'S AMALGAM, 1 oz., 2.00; 2 ozs., 3.75; 4 ozs., 7.00; 10 ozs., 15.00
WELCH'S OXYPHOSPHATE, large, \$1.50; medium, \$1.00
LIQUIDS OR POWDERS, large, 75 cents; medium, 50 cents

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Open October 1st

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Georgetown University School of Medicine

DENTAL DEPARTMENT

Formerly Washington Dental College, Washington, D. C.

Sessions will be held in daytime and begin October 1, 1903, and end May 31, 1904. For terms and further information, apply to

W. N. COGAN, D.D.S., Dean

The Sherman Apartment House

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DEPARTMENT OF DENTAL SURGERY
UNIVERSITY OF INDIANAPOLIS

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MODERN METHODS BRING MODERN RESULTS.
A LARGE CLINIC AND A VARIED ONE.
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For full information, address the College
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INDIANAPOLIS, IND.

New York College of Dentistry

Incorporated by the Legislature of the State of New York in 1865

1903-1904

38th COLLEGIATE YEAR

FOUR-YEAR CURRICULUM COMMENCES

Infirmary Course

May to October 1903 (Optional and Free)

Lecture Session

October 1903 to May 1904 (Obligatory)

For admission preliminary educational, curriculum, and other requirements write for an announcement, addressing

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L. D. ARCHINARD, D.D.S., Professor of Oral Pathology, Therapeutics, and Dental Materia Medica.

SAM'L R. OLLIPHANT, M.D., Professor of Chemistry and Materia Medica.

C. VICTOR VIGNES, D.D.S., Secretary, Professor of Prosthetic Dentistry and Metallurgy.

E. DENEGRÉ MARTIN, M.D., Professor of Anatomy and General and Oral Surgery.

MILTON R. FISHER, D.D.S., Professor of Dental Anatomy, Operative Dentistry, and Orthodontia.

EDWARD L. MCGEHEE, B.S., M.D., Professor of Physiology, Pathology, and Hygiene.

JOHN J. ARCHINARD, A.M., M.D., Professor of Bacteriology, Histology, and Pathological Anatomy.

The College will move into its new quarters, No. 831 Carondelet Street, in September.

The next session opens October 6, 1903, and will continue seven months.

NEW ORLEANS, the metropolis of the South, offers unlimited clinical material, complete educational facilities, a delightful winter climate, convenient bicycle routes, inexpensive recreations, its world-famous Mardi Gras celebrations, and board as low as \$3.00 per week. Collateral medical branches are fully illustrated in clinics and laboratories.

Dentistry is taught by Lectures, Demonstrations, and Infirmery Practice

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The Diploma of this College is recognized by the National Association of Dental Examiners.

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Colorado College of Dental Surgery

UNIVERSITY OF DENVER

DENTAL DEPARTMENT

FOUNDED 1886

FOURTEENTH AND ARAPAHOE STREETS, DENVER

THE SEVENTEENTH ANNUAL SESSION will begin October 6th, 1903.

The requirement for entrance is a certificate of two years' completed high-school work, or its equivalent.

The course of instruction is graded, and covers a period of four years.

There is a teaching force of twenty competent instructors. The clinic is abundant. The building is commodious and thoroughly equipped for the teaching of modern Dentistry.

The climate of Colorado for lung and kindred diseases is equal to any in the world.

This School is a member of the National Association of Dental Faculties and recognized by the National Board of Dental Examiners.

For information and Annual Announcement, apply to

A. L. WHITNEY, D.D.S., Secretary
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California Building

UNIVERSITY OF MARYLAND DENTAL DEPARTMENT



HE regular Winter Session commences on October 1st of each year and ends in the following April.

The Annual Catalogue contains Courses of Study, etc. Attendance upon four regular winter sessions will be required before the final examinations for the degree of Doctor of Dental Surgery. Any candidate who may fail to pass the final examinations in April will have the privilege of a second examination in the following October without further attendance at a regular session. Graduates of medicine and those who have attended a recognized dental school for one or more sessions are admitted to higher grades on entering this school. The requirements for admission are the same as in all reputable dental colleges, and according to the rules of the National Association of Dental Faculties.

Matriculation fee, \$5; Tuition for each session, \$100; Graduation fee, \$30; Dissecting fee, second or third year, \$10.

For information and catalogue, address

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845 N. EUTAW STREET BALTIMORE, MD.

Chicago College of Dental Surgery

THE TWENTY-SECOND ANNUAL COURSE OF INSTRUCTION will begin about the 1st of October 1903, ending about May 1, 1904. The location of the College is ideal, standing in the center of the great Medical College and Hospital District of Chicago. Instruction is complete in every detail. The Clinical Material is abundant. The College Building and its Equipment offer unsurpassed facilities to the Dental Student.

FOR ANNOUNCEMENT AND DESCRIPTIVE BOOKLET, ADDRESS

Dr. Truman W. Brophy, Dean
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Harvard University, Dental Department BOSTON, MASS.

The thirty-fifth annual session of this school begins October 1, 1903, and ends June 24, 1904, with a recess of one week at Christmas and another in April, making a school year of nine months of practically continuous work.

COURSE OF INSTRUCTION

FIRST YEAR: General Anatomy (including dissection of three parts), Physiology, Physiological Chemistry, Dental Chemistry, Hygiene, Histology and Embryology.

SECOND YEAR: Bacteriology, Operative and Mechanical Dentistry (theory and practice), Crown and Bridge-Work and Metallurgy (theory and practice), Orthodontia (theory and practice), Dental Pathology, Oral Surgery, Materia Medica, and Therapeutics.

THIRD YEAR: Operative and Mechanical Dentistry (theory and practice), Crown and Bridge-Work and Metallurgy (theory and practice), Neurology, Surgical Pathology and Surgery, Orthodontia (theory and practice).

The University Degree D.M.D. (Dentariæ Medicinæ Doctor) is conferred upon all who fulfill the requirements.

Graduates of recognized Dental Schools will be admitted to the courses of Operative and Mechanical Dentistry on payment of \$50 for each course for the whole or any part of the academic year.

FEES

There are no fees for matriculation, nor for the diploma, nor for the Demonstrators. For the first year the fee is \$200; second year, \$150; third year, \$150; for any subsequent year, \$50.

FOR FURTHER INFORMATION, ADDRESS

EUGENE H. SMITH, D.M.D., Dean, 283 Dartmouth St., Boston, Mass.

SESSION
1903-1904

The
next regular
WINTER
SESSION
will begin
OCTOBER
1, 1903
and continue
until
MAY 1, 1904

Birmingham Dental College

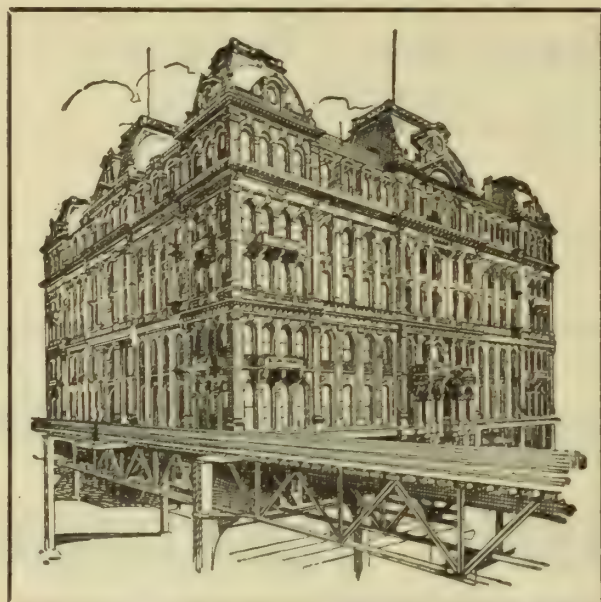
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IDEAL LOCATION.—Situated within the Elevated Railroad Loop, not more than three squares from every line of transportation. Convenient to business center. Accessible to the entire population of two millions of people, insuring an abundance of clinical work of every kind and character.

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LECTURE ROOMS.—Perfect in arrangement, ventilation, and light.

ORAL SURGERY.—The increased interest and demand for training in this branch of dentistry by the profession and student has been recognized by the University, and a magnifi-

cent amphitheater, with a seating capacity for over two hundred students, is provided for this department. In connection with this there are separate waiting and preparation rooms for exclusive use of oral surgery patients, and there are also recovery rooms provided for the subsequent care of patients recovering from anesthetics or undergoing extensive operations. The whole department is equipped with every modern convenience.

ADDED LABORATORIES.—In order to meet the requirements of advanced dental education, the University has added Freshman Chemical, Physiological, and Physical Laboratories to their Laboratory equipment.

The School has been enlarged in all its departments to meet the increasing demands, and no expense has been spared to make it the best in every particular.

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DETROIT COLLEGE OF MEDICINE

Department of Dental
Surgery

DETROIT, MICHIGAN

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recognized by the National Board of Dental Examiners*

ESTABLISHED 1891

THE THIRTEENTH ANNUAL SESSION will begin September 23, 1903,
and continue nine months.

FOUR FULL COURSES OF STUDY of nine months each are required
for graduation.

FEES: Matriculation, \$5.00 Regular Course, \$60.00
Graduation, \$30.00

A perpetual ticket (not transferable), good for four
or more courses, will be issued for \$200.00

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DR. H. O. WALKER, Secretary
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Detroit College of Medicine, Detroit, Mich.

Baltimore

Medical College

Dental Department

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An Institution of the University of the State of New York

216 West 42d Street

CO-EDUCATIONAL MEMBER N. A. D. F.

SESSION 1903-1904 BEGINS OCTOBER 6, 1903

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523 WEST 141st STREET

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Dental Department

PARNASSUS AVENUE, SAN FRANCISCO

THE Twenty-second Session will commence Monday, September 7, 1903, and close May 31, 1904. No student can be admitted after September 17, 1903.

The examination for admission will be held September 4 and 5, 1903.

The requirements for admission are three years of High School work, including one year's study of Latin. High School diploma, or certificate covering this amount of work, will be accepted in lieu of an examination.

Course on and after September 7, 1903, will be four years.

Commencing with session of 1904-05 High School diploma necessary for admission.

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For further information, application blanks, or an announcement, apply to

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MEDICO- CHIRURGICAL COLLEGE OF PHILADELPHIA

Department of Dentistry

THE FALL SESSION will commence on Sept. 1, 1903, the regular Session on October 5, 1903, and will continue seven months, examinations and graduating exercises being held concurrently with those of the Medical and Pharmacy Departments.

A thorough course including Lectures, Demonstrations and Quizzes will be given, thereby insuring to the student an eminently practical and scientific Dental education.

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E. A. DE SCHWEINITZ, PH.D., Professor of Chemistry.
WM. P. CARR, M.D., Professor of Physiology.
THOMAS A. CLAYTON, M.D., Professor of Materia Medica.
D. K. SHUTE, A.B., M.D., Professor of Anatomy.
J. R. HAGAN, D.D.S., Professor of Oral Surgery.
JAMES CARROLL, M.D., Professor of Bacteriology.
WM. R. TRAIL, D.D.S., Professor of Dental Technics.
JOHN B. NICHOLS, M.D., Professor of Histology.

The Regular or Winter Session begins about the first of October and ends April 30.
The infirmary opens October 1 and closes July 1.

F E E S

ANNUAL TUITION FEE.....\$100

There are no other Charges, or Extras of any kind for Tuition

FOR FURTHER INFORMATION, ADDRESS

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A HIGH-CLASS school for high-grade students.
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 H. W. ARTHUR, D.D.S., Professor of Dental Anatomy, Operative Dentistry, and Technics.
 STEWART L. MCCURDY, A.M., M.D., Secretary, Professor of Anatomy, Oral and General Surgery.
 J. H. BEAL, Sc.D., PHARM.D., Professor of Chemistry and Metallurgy.
 THEODORE DILLER, M.D., Professor of Physiology and Embryology.
 CLEMENT R. JONES, M.D., Professor of General Pathology, Materia Medica, and Therapeutics.

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 DON. S. LEET, D.D.S., Lecturer on Dental Histology.
 E. W. ARTHUR, A.B., Lecturer on Dental Jurisprudence.

DEMONSTRATORS

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 CHAS. R. FUNDENBERG, D.D.S., Demonstrator of Prosthetic Dentistry.
 DAVID T. JENKINS, M.D., Demonstrator of Anatomy.
 JOHN S. ASHBROOK, D.D.S., Assistant in Oral Surgical Clinic.
 H. H. MYERS, D.D.S., Demonstrator of Operative Dentistry.
 E. C. HAWKINS, D.D.S., Assistant Demonstrator of Prosthetic Dentistry.
 H. D. HOWARD, D.D.S., Demonstrator of Dental Ceramics.
 T. A. HOGAN, D.D.S., Assistant Demonstrator of Anatomy.
 J. C. RANKIN, D.D.S., Demonstrator of Local Anesthetics.

This college is a member of the National Association of Dental Faculties. The building has unobstructed light on three sides, steam heat, hot and cold water, natural and artificial gas, electric current for lighting and motor power.

Students are eligible to and participate in all features of university life common to the whole student body of the institution.

For announcement and descriptive booklet, address

PENNA. AND 10TH ST.
 PITTSBURG, PA.

Pittsburg Dental College

DEPT. OF WESTERN
 UNIVERSITY OF PA.

OHIO COLLEGE OF DENTAL SURGERY

Department of Dentistry, University of Cincinnati

CENTRAL AVE. AND COURT STREET

CINCINNATI, OHIO

THIS College was established in Cincinnati in 1845 and was the pioneer Dental School in the West. The present course for the degree is three years of seven months each. One year will be added to this course beginning with the session 1903-4. THE REGULAR WINTER SESSION BEGINS EACH YEAR ABOUT OCTOBER FIRST AND CLOSES MAY FIRST. Optional Spring and Fall courses in Clinical Instruction are also given beginning May first and continuing three months and beginning September first and continuing one month respectively. THE SCHOOL IS CO-EDUCATIONAL. It has a teaching corps of twenty instructors. Its clinical material is abundant, drawing from a population of more than half a million people. Its buildings are large and THOROUGHLY EQUIPPED FOR MODERN DENTAL EDUCATION.

For the 57th Annual Announcement and other information, address

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116 Garfield Place, CINCINNATI, OHIO

Pennsylvania College of Dental Surgery

FOUNDED 1856

ELEVENTH AND CLINTON STREETS, PHILADELPHIA

BELOW SPRUCE STREET

The forty-eighth annual session will begin October 5, 1903.

The entrance requirement is a certificate of two years completed high school work or its equivalent. For those not holding the required credentials, entrance examinations will be held at stated periods; dates and subjects will be forwarded on application to the Dean.

The requirement for graduation is attendance on four regular courses of instruction of seven months each and the passing of satisfactory intermediate and final examinations. Frequent quiz and review examinations are held throughout each session.

The course of instruction is thorough, progressive, and practical. By lectures, demonstrations, quiz examinations, laboratory experimentation, and continuous clinical practice, the student is fitted on graduation to enter at once on active professional work.

Since its foundation, 2527 graduates have received the diploma of the school, the list of alumni being larger than that of any other dental college in the world.

For catalogue and further information, apply to

WILBUR F. LITCH, M.D., D.D.S., Dean

1507 Walnut Street

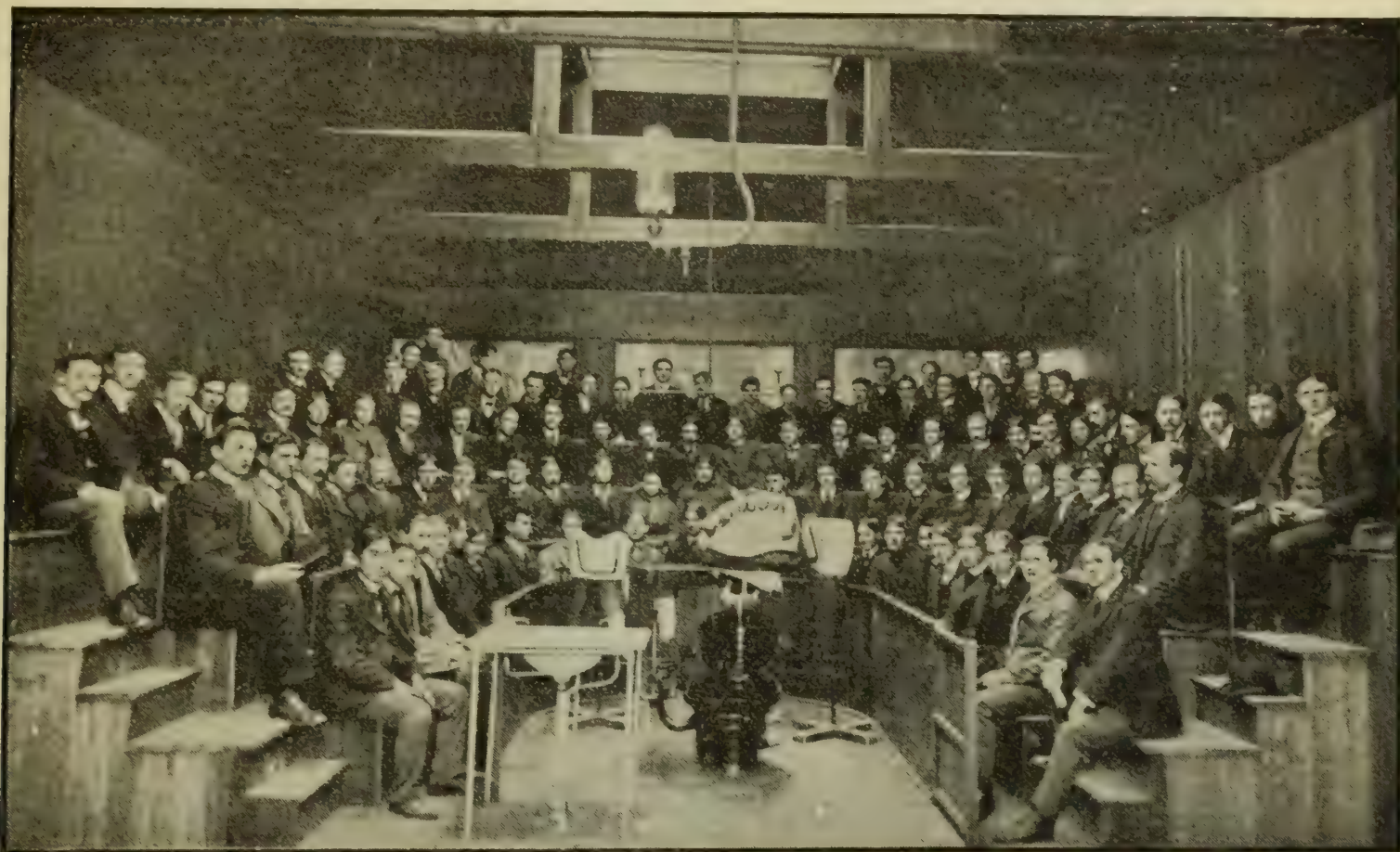
GEO. W. WARREN, A.M., D.D.S., Secretary

1338 Walnut Street

NORTH PACIFIC DENTAL COLLEGE

PORTLAND, OREGON

ELEVENTH ANNUAL SESSION BEGINS OCTOBER 1, 1903



CLINICAL DEMONSTRATING ROOM

COURSE OF STUDY

The regular session begins October 1st, and continues until May 1st. Lectures commence the first day and the systematic work of the school year begins as soon as the respective classes can be organized. The course of instruction is progressive and covers a period of four years.

The students are graded into freshmen, sophomore, junior, and senior classes, these, with but few exceptions, having separate and distinct courses of study. In the operative and prosthetic clinics the teaching is directed to the individual pupil, and adapted to his particular needs.

The distinctive feature of the curriculum of this school is its recognition of systematic, practical work by every student, as the necessary groundwork. Full laboratory courses have been provided in operative and prosthetic technics, chemistry, metallurgy, histology, pathology and bacteriology, and systematic, practical instruction in the examination and treatment of patients in the general and special clinics of the school.

THE CLINICS ARE UNSURPASSED

—the clinical patronage of the infirmary being in excess of the needs of the students.

TUITION

Matriculation	\$5.00
Fees for each year	110.00
Graduation	20.00

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JOHN WALTERHOUSE LORD, A.B., LL.B., Counsel and Lecturer on Dental Jurisprudence.

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The fact that dentistry must be practically taught is fully recognized, the College Infirmary, a most complete, large, and handsome hall, being daily filled with clean and respectable patients, of a class nearly equal to those of the average dentist. The Infirmary is open all the year. For Summer Session, no charge to those who attend the following Winter Session.

The session begins October 1, closing in April. A large corps of demonstrators, always present, put in actual practice the teachings of all lectures in dentistry, leaving nothing undemonstrated. All methods are fully taught, all appliances and apparatus used;

the making of instruments and the most elaborate gold and continuous-gum work, and all the cases arising in ordinary practice, with many which are rarely seen, carefully demonstrated.

Commencing October 1, 1895, women will be admitted to this College, subject to the same requirements as men.

The College has formed an alliance with the College of Physicians and Surgeons by which its students are privileged to attend all lectures and clinics. The patients of this medical school numbered last year over 40,000.

The qualifications for entering the first year's course are in accordance with the resolutions adopted by the National Association of Dental Faculties.

TERMS OF GRADUATION.—Attendance on four winter courses of lectures in this College; as equivalent to one of these we accept one course in any reputable dental college. Graduates in Medicine can enter the Junior Class.

FEES.—Matriculation (paid only once), \$5.00. Tuition fee, \$100.00. Diploma fee, \$30.00. Dissecting fee, \$10.00.

Students corresponding with the Dean will please be careful to give full address, and direct their letters to

M. W. FOSTER, M.D., D.D.S., Dean, No. 9 W. Franklin St., Baltimore, Md.

Tufts College Dental School

Formerly **BOSTON DENTAL COLLEGE**

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M A S S .

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Entrance examinations will take place Monday, June 8th, and Saturday, October 3, 1903. Registration of students closes October 16, 1903, according to the requirements of the National Association of Dental Faculties, of which this school is a member.

This school inaugurated the four-year course in 1902-03. Students admitted to the Senior Class of 1903-04 will be received upon the three-year basis.

For further information or catalogues address the Secretary,

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other schools showing equivalent education. In lieu of such diploma or certificates, the applicant will be required to pass a matriculate examination which will in each case be the equivalent of that forming the basis of the certificates of required preliminary education.

FEES

Matriculation Fee (paid once only).....	\$5.00
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Dissecting Fee—First and Second Year, each.....	6.00
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Board can be obtained at from five to eight dollars per week, according to location and accommodations

The Dental Department is located in "Dental Hall," the new building especially erected for its use. The facilities thus afforded are, it is believed, unequalled for securing an education complete in all departments of dental science and art. The clinical operating room is 180 by 50 feet, lighted on all sides, and furnished with 100 Wilkerson Chairs of latest pattern, especially constructed for the Department. Each operating chair has a fountain spittoon attached, also especially designed and constructed for this Department. Electrical service is supplied to all chairs, and is of a character to cover all of the applications of electricity to dentistry. The Prosthetic Department is supplied with laboratory facilities devoted to every branch of the work. Prosthetic technic, in vulcanite and metal work, porcelain work, continuous-gum work, and crown and bridge work, is taught by modern methods in separate laboratories especially equipped for the purpose. The laboratories are furnished with power

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Oral surgical clinics, also general surgical clinics, are held twice a week.

Practical instruction in Chemistry, Metallurgy, Histology, Physiology, and Bacteriology is given in appropriately equipped laboratories.

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All of the departments of practical laboratory and clinical instruction are in charge of competent and ex-

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The Dental Department of the University is an integral part of the University system. Its students at the discretion of the Dean are permitted to take courses of instruction in other departments of the University without additional fees, and are eligible to and participate in all those features of University life common to the whole student body of the institution.

These include its athletic features and privileges of the Howard Houston Hall, the club house of an organization governed by the University students and having all of the appointments and desirable features of a strictly first-class club. The dormitories of the University are the best of their kind in this country, and to these the students of dentistry are admitted in common with the students of all the other departments.

THE ANNUAL SESSION

The session begins the last Friday in September, and ends at Commencement, the third Wednesday in June. (No student admitted to the regular course after October 10th.) The number of lectures per week, with a synopsis of the various branches taught, will be found in the General Catalogue.

For the session of 1902-03, attendance upon three regular courses of lectures will be required before the student can take the final examination for the degree of Doctor of Dental Surgery.

FOR THE SESSION OF 1903-04 THE COURSE OF INSTRUCTION FOR THE ATTAINMENT OF THE DEGREE OF DOCTOR OF DENTAL SURGERY WILL BE INCREASED TO FOUR YEARS.

In order to facilitate work in the practical branches, and to economize the student's time, the regular session is so arranged that students during the first year are required to devote the time equally to DENTAL, HISTOLOGICAL, AND CHEMICAL LABORATORY WORK. During the second and third years the student has practically the entire forenoon of each day for dental work. Thus ample opportunity is afforded for practice in OPERATIVE AND MECHANICAL DENTISTRY. In the latter branches the students of the first year are divided into sections, devoting the time not otherwise engaged to practice in the operating rooms.

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The gradation of the course enables the First-year student to present himself for examination in the following branches: CHEMISTRY, HISTOLOGY, and ANATOMY, including OSTEOLOGY and MYOLOGY. The second-year student will be examined in MATERIA MEDICA, BACTERIOLOGY, APPLIED ANATOMY, and PHYSIOLOGY, and on the progress in OPERATIVE AND MECHANICAL DENTISTRY. Such an arrangement is economical not only in point of time, but also in facilitating a student's acquirement of knowledge in the remaining branches.

The final examination at the close of the third year is in OPERATIVE DENTISTRY, MECHANICAL DENTISTRY, METALLURGY, CLINICAL DENTISTRY, DENTAL PATHOLOGY AND THERAPEUTICS, AND ORAL SURGERY.

All applicants for advanced standing must pass the required examination of this school, or furnish proof that they have passed EQUIVALENT examinations in some recognized dental or medical school. Graduates of a recognized medical college will be admitted to the second-year class without examination.

For detailed information and announcements, address

EDWARD C. KIRK, D.D.S., Sc.D., Dean of the Dental Faculty

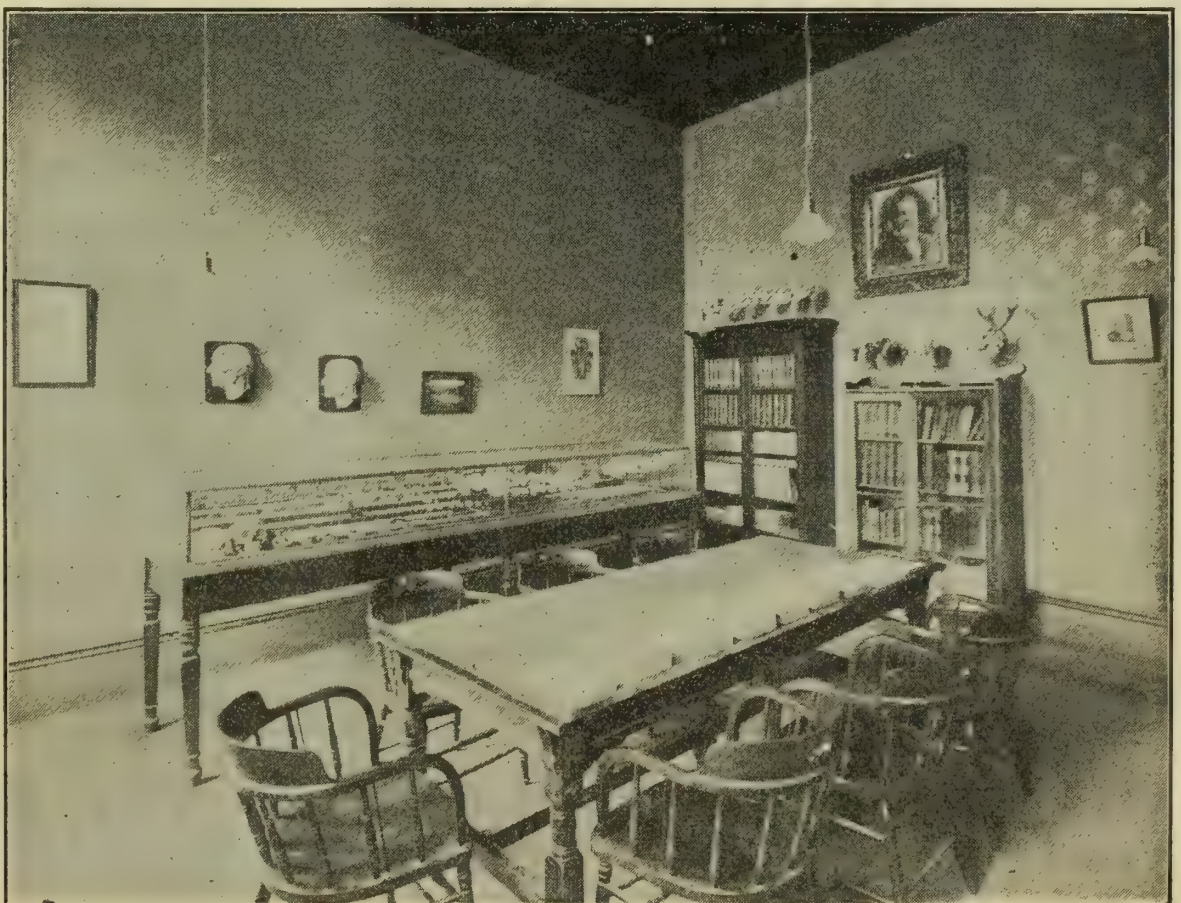
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